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CARPET-MAKING IN THE BOMBAY PRESIDENCY.

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M

One of the Famous Pile Carpets of Bijapur.

See pages 2, 62, and 70 of the text. From a pattern in the Yeraoda Central Prison Carpet Factory. The original with about fifteen others are at Bijapur. Copies from all the old Bijapur carpets are at Yeraoda; and since the compilation of this work a second set of copies carried out afresh from the originals as faithfully as possible has been made.

A MONOGRAPH

ON THE

ART & PRACTICE OF CARPET-MAKING

IN THE

BOMBAY PRESIDENCY

CONNEMARA
11 JUN 1907

BY

H. J. R. TWIGG, M.B., B.C., CAPTAIN, I.M.S.,
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INTRODUCTION.

SCOPE OF MONOGRAPH.—This Monograph aims at giving an account of Carpet-making in this part of India in the past; the conditions under which the craft now exists; the current methods of manufacture; the probable future of the industry; the possibility of improving future prospects.

DEFINITIONS.—Most people have an idea of the meaning of the term 'carpet'; but the conundrum 'When is a carpet not a carpet?' opens up unexpected difficulties. To restrict the term to the article usually thought of would cut down this Monograph to the narrowest limits, especially if the purely industrial side alone were discussed, for in this Presidency, outside jails, woollen pile carpets, that is to say, carpets as usually understood, are practically not made at all.

(*a*) The ordinary carpet has what is termed 'pile' on one surface. This pile consists of the upstanding ends of very numerous pieces of wool woven in by hand to an understructure generally of cotton. Such is the ordinary *galicha* or pile carpet. The pile may be of hair or cotton, and the understructure need not be of cotton, yet the article would still be a *galicha*. Its pile is its distinguishing feature.

(*b*) The other common form of carpet is the *dari*. This presents a flat surface on each side; the design is identical on both sides; the entire article is generally of cotton. It may be of hair or wool and still be a *dari*. Its similar and flat surfaces distinguish it.

(*c*) There are certain *dari*-like articles which should really fall under totally different headings. No definition will be quite clear till the chapter on Construction has been read. It will suffice to state here that the pattern in a *dari* is obtained by passing under and over certain cotton threads variously coloured pieces of yarn the ends of which are broken off and the tags tucked in neatly. In Baluch carpets such a piece of dyed yarn would not be thus divided but would merely be passed on the undersurface of the fabric to the spot above which that particular colour should re-appear on the surface. Hence the two surfaces do not exactly agree in design. The work is in fact a sort of rough tapestry, in which however, owing to its comparative coarseness, needles are not used.

(*d*) Again, there are certain articles (of which the ordinary striped *dari* without a border and not more than six feet in width is typical) which might equally well be regarded as carpets or as merely thick cloth. In Mr. Brendon's 'Woollen Fabrics,' Plate IV is an excellent illustration of a loom on which could be equally well made cloth, blanketting, or a *dari* of simple design. In such a loom a shuttle is used, and, strictly speaking, no article should be regarded as a carpet, be it called *dari* or not, in which all the weaving required in its making can be provided by shuttle work.

Apart from pure definitions, there are certain terms which are used very vaguely, *e.g.*, there is no exact distinction between a *dari* and a *satranji.* The difference seems to be chiefly a matter of size, the *dari* being the smaller. The same confusion exists between mats, rugs, and carpets. A mat, it is true, is generally laid in a doorway or at a window to receive the wear and tear of passing feet; a rug too is generally small enough to be easily spread and removed. In America carpets are often called rugs. In England the custom of covering the entire floor is less common than formerly, partly on artistic and partly on hygienic grounds, as well as on account of expense. To the smaller fabrics now replacing the old carpet, the terms 'carpet' and 'rug' are indiscriminately applied.

Still the conundrum 'When is a carpet not a carpet?' is not yet fully answered. Many of the old Persian carpets were so delicate and light in texture that not even stockinged feet were allowed on them. Many of these articles were used as *portières* or wall or ceiling decorations or were spread over cushions. In Sind, the *farasi* is rarely spread on the floor but rather on the bed. Again, among the free population of the Presidency proper, the very few articles still made by home-workers and entitled to be called carpets by reason of the method of making are used for anything but ordinary carpet purposes. The *jhorya* of the Deccan protects cotton or fruit; the *gudhar* is used in the same manner. In Gujarat, an article similarly made covers the loaded carts in rainy weather. The lesson to be learned from these facts is painfully clear. Only the very coarsest articles, too rough for personal wear and too coarse for domestic use, can be made by the peasant. It does not pay the smaller man to make fine articles.

So far as can be ascertained, no carpets are made by machinery in this Presidency.

DIVISIONS OF THE SUBJECT.—A considerable divergence from the method adopted in Mr. Samman's 'Cotton Fabrics of Assam' has been unavoidable. Carpet-making differs from nearly all other industries in being conducted almost entirely within jail walls. Especially is this true of Western India. In seeking information as to numbers employed and similar matters, the replies would have been humourously absurd had they not also connoted declining prosperity, at least among certain communities. For example, such phrases as 'there were two men engaged three years ago in the work, but one is now dead and the other blind.' Or the news that 'a few old women alone are employed, and when they die the industry will drop out.' All this denotes an industry on its last legs and never of a profitable character, at which most of the workers give only a part of their time or are too old for other work. From such as these, correct statistics are impossible and certainly of little value. Hence such matters as numbers employed, sex, caste, capital invested, and similar topics do not enter to any great extent into this work.

More attention has been paid to the following: Has the industry ever flourished? Is it going down-hill? Can any improvement be brought about—involving inquiry into raw materials, dyeing, mode of manufacture, outside competition, and the influence of jail labour? These and other topics are discussed in their proper places.

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The Principals of the Art Schools at Bombay and Ahmednagar.
The Superintendents of Jails of the Presidency.
The Superintendent of the Government Central Press, Bombay.
The Vazir of the Khairpur State.
And many others, private friends and officials, extending from Mysore to Turbat-i-Haidari.

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CHAPTER I.

Historical.

FEW writers on Oriental carpet making have ever been able to produce more than an imperfect historical survey of the subject, and of necessity, restriction to India, and *à fortiori* to the Bombay side, still more narrowly reduces the number of well established historical facts.

Carpet making and ordinary weaving in some of their branches overlap; embroidery and tapestry too in certain respects resemble various forms of carpet work. A very brief and general survey is therefore given of these crafts in the East.

The making of coverings for the body seems to have originated among the nomad tribes of Central Asia, but at what date conjecture alone can tell. The earliest advances towards rudimentary civilization must certainly have preceded the strictly historical period of man's history. These early coverings were at first skins. The weaving of cloth denotes a very early advance; and it is noteworthy that the earliest authentic records of a cloth loom at Beni Hassan in Egypt dated about 3000 B. C. depict looms almost identical in structure with those in use throughout the East at the present time. It is impossible to state exactly when *dari* and *galicha* weaving came in. These articles were first made in primitive form by tent-dwellers—those located in warm climates evolving the *dari* of cotton, those in cold climates the woollen *galicha.*

Pile carpets were used at a very early date in Egypt. The earliest specimens probably were exported there. Weavers from Babylonia subsequently made carpets in Egypt. Thence the craft spread westward along Northern Africa into Sicily and Spain. While this extension from Babylonia westward was in progress, a similar extension eastward into Persia and the countries to the north-east took place. With the numerous changes of rulership in the lands now centring around modern Persia came extensions and recessions with regard to the fine arts and handicrafts of Babylonia. The result is that in carpets hailing from Central Asia there is to this day such an intermingling of characteristics that Asia Minor, Trans-Caspiana, Persia proper, Baluchistan, and China are all represented in greater or less degree. This intermingling indicates a very early origin in some central district at a date prior to exact chronology with subsequent ebbing and flowing with the tides of military and political change. Trade routes may have played a small part in diffusing typical forms of skilled handicraft, but military camps probably played a far greater part. The *galicha* as regards India has merely followed Mahomedan advance; but as to how the *dari* has arisen in or spread throughout India much less is known. As Mr. Dutt has pointed out, early civilization centred mainly around four large rivers; and of these, two, the Indus and the Ganges, are Indian. About 2000 B. C. the earliest Hindus settled

on the Indus; the Gangetic Valley was colonized between B. C. 1400 and 1000; the rest of India was overrun by Aryan invaders between B. C. 1000 and 320. The *dari* was known in Bengal at a very early date; but at what stage of this Aryan progress it arose, and whether within India or outside it, there is nothing to record. However the *dari* is more typically Indian than the pile carpet.

Later chronology furnishes few data as regards carpet-making. The following refer to events of more or less direct interest. About 1634 the Emperor Akbar maintained a carpet factory, and the frontispiece of Vol. XI of the 'Journal of Indian Art and Industry' represents a carpet made in the royal factory. Much of the best work now done in India can still trace its origin to the skilled artists Akbar employed.

In the 16th and 17th centuries Shah Abbas did for Persia what Akbar did for India. Fearing the ill influence of Khorassan weavers on the native industry, he procured from Venice, then in its zenith, the finest artists of the day, and to them must be largely ascribed that characteristic sweeping floral design abounding in the most beautiful curves which so distinguish Persian designs from those of other Asiatic lands. Nearly all the old Indian patterns are almost entirely Persian in origin, and the best of these show that bold floral curvature referred to.

In Elizabethan days Cambay was celebrated for carpets, equal in the opinion of one writer to those of Turkey and Persia. One of the main duties of the Chief Factor was the purchase of 'carpets celebrated in Europe.' Cambay in those days was what Surat and Bombay have since become, namely, the chief place of export and import, and it is not clear whether these Cambay carpets were made at Cambay or further inland. Communications though bad certainly did exist, and the present poor condition of all the raw material needed for carpet work in that part of India justifies a doubt as to whether the old carpets were of strictly local weaving.

In the Delhi Exhibition certain historical carpets from Bijapur were on view and aroused well-merited interest. Of these nine were old woollen pile carpets, the tenth being a cotton *janamaz*. The woollen carpets were kept in the Asar Mahal at Bijapur. By repute these carpets—possibly, though not certainly, presents—were included among certain relics brought to Bijapur in the time of Ibrahim Adilshah II between 1580 and 1626. They were probably ordered out by King Mahomed Adilshah. An old manuscript, the Haft-Kursi-i-Padshahan, gives the date of their arrival from Kashmir in A. H. 1067 or A. D. 1657, the last year of Mahomed Adilshah's reign This date is probably authentic, as after the death of Mahomed Adilshah the decline of the Bijapur kingdom had commenced, and it is not likely that costly foreign materials could have been ordered out after his reign. It is therefore almost certain that the carpets are two hundred and fifty years old and were made at Kashmir. The carpets are supposed to be used only once during the year when they are spread in the upper halls of the Asar Mahal on the birthday of the Prophet. Not much is known about the cotton *janamaz* from the Jamai Mosque. A local tradition is that it is one of the few carpets left to the mosque by the Emperor Aurangzebe after the conquest of Bijapur in 1626, he preferring the bare floor to carpets for prayers. The carpet would thus appear

to be about two hundred years old, and is probably of local origin, as carpet-weaving was and still is one of the industries of Bijapur, and the pattern goes to confirm this opinion.

The above account, copied almost *verbatim* from a letter from the Collector of Bijapur, appeared with the exhibits.

Exhibitions have in recent times played not a small part in encouraging carpet-making in India. The Great Exhibition of 1851 had a marked influence. Prior to that date only the wealthy and connoisseurs had any knowledge of Indian carpets. The magnificent specimens shown, of which some still exist in the National and in private collections, demonstrated to all on-lookers the possibilities of Indian carpet work. Orders poured in, at first of a reasonable character, but there soon arose a clamouring for reduced prices, modifications in colour and design, and a time-limit for delivery. The result was a deplorable falling off in excellence. To account for this, the system of making carpets in jails was called to task, but the demands of the purchaser are now realized to have been the true cause of the decline. Fortunately, although the old standard of excellence never can be regained, much improvement has occurred during the past decade. The Bombay Presidency came very little under the influence of the Great Exhibition in this respect, for its carpet-producing jails were not numerous, while outside prisons there are surprisingly few centres where such fabrics are made.

In 1900 the Shah of Persia decreed that thenceforth all aniline should be absolutely kept out of the country or destroyed. It seems that the decree has been carried out, apparently with the result that, during the years 1899-1901, enormous numbers of aniline-dyed carpets left Persia. Every carpet collector must regret that there are weighty reasons why aniline can hardly be excluded from India in a similar manner.

The Delhi Exhibition of 1903 had a wholly good effect on the Indian carpet trade and brought home to the public the fact that, if the purchaser will be reasonable as regards price, design, and time, he can still get from nearly every province of India carpets of great excellence. Agra, Amritsar, Lahore, and other places benefitted greatly, while in this Presidency at least one institution, the Yeraoda Prison, was overwhelmed with orders. And it was the high-priced high-class article which was in most demand.

A large proportion of those visiting the exhibition was American; but the Delhi Exhibition will not by itself explain the enormous development of late years in the trade with the United States in Oriental carpets. America does not reckon carpets among its own products. The best carpets require for their making conditions diametrically opposite to the highly organized hurry of an American factory; the modern fashion of spreading small rugs of considerable but not excessive price over wood-laid floors; the wealth of many Americans; the glamour of the Orient—all these are factors which in conjunction account for the recent trade with the United States. No jail-made goods are allowed; it is from such places as Amritsar, Lahore, Agra, Mirzapur, that most of the carpets go; but there are scattered up and down the whole of India surprisingly numerous institutions, partly commercial, partly industrial, partly missionary or scholastic, which send

carpets to America. It is idle to suppose that anything more than a small fraction of the carpets sent to America are other than of mediocre quality; this however is not the fault of the weavers here but of the purchasers there. It is by means of this large body of cheap orders that the highly organized factories of Northern India pay a sufficient return. Still no one can gainsay the fact that if the West will order from the factories of the East low-graded goods, the Amritsar–Agra type of factory can give the purchaser more for the little money offered than any jail possibly could. So well organized are some of these factories, so carefully have designs and colours been studied, so highly trained are the heads of departments, that should anyone ask, he can get from them as good a carpet made as might be wished for.

At the time of going to Press, the papers announce that Kashmir has followed the example of Persia, and henceforth all aniline will be prohibited. Among the samples of work either seen in Native States or sent from Native States for inspection all had one failing. Some of the very best weaving, the best spinning, in particular the best designs, were found in these Native State-made samples. In all the dyeing was very bad. This is not because the art is lost, but rather because the articles are cheaper and the vivid colours are admired. It is to be hoped that every Native State will soon follow the example of Kashmir.

CHAPTER II.

District and Trade Reports, etc.

The state of the craft of carpet-making and its attendant trade at the present time and during recent years can be judged from the following reports, most of which were obtained by sending, through each Collector, to the officer in charge of each taluka, a set of questions indicating the nature of the information wanted. Replies came from nearly every taluka, but they were, as anticipated, nearly all of a negative character. In anticipation of this result, the questions were framed with a view to ascertaining how each taluka was in a position to supply raw material or labour for carpet-making with a view to future possibilities rather than to merely collect bald facts as to whether carpets were or were not made in any particular locality.

In addition, Art and Industrial Schools, Missions, Jails, and certain Native States were also questioned. The Customs authorities supplied data referring to the general carpet trade of Western India through Bombay and Karachi, but it is not easy to distinguish in these latter reports Presidencial from extra-Presidencial industry.

Ahmedabad.—Bombay shop-keepers sell carpets purporting to come from Ahmedabad, but most visitors to the latter place would generally fail to see signs of carpet-making. Mr. Brendon, in his 'Woollen Fabrics,' refers to the Ahmedabad Carpet Manufacturing Company. Costly labour has compelled this firm to transfer its weaving branch to Nadiad in the Kaira District. At Gogho, Messrs. Hathasing opened a woollen carpet factory, but their successor found it unremunerative. Wool suitable for the purpose is difficult to get, and the many cotton mills swallow up all local labour. Boys of no particular caste are mostly engaged and give the whole of their time to the work. At first trained hands had to be brought from Delhi, but now locally trained boys are to be had. This slight advantage is the only benefit which has latterly accrued to this factory. The *galichas* made fetch from six to seven rupees a square yard, and even this low price fails to attract many buyers. *Daris* being cheaper are in greater demand, but most of those purchased come from Agra and Cawnpore. The locally produced *dari* is usually in plain stripes and could be made on a shuttle-worked loom. If Mr. Churchill or Mr. Havell could modify their fly-shuttle looms to work with the rather thick material which is used for *daris*, there is no reason why with a large daily output a peasant or at least his womenfolk could not find in *dari*-making a way of considerably increasing the family earnings.

Broach.—Amod, Jambusar, and Vagra report that woollen carpets of the most elementary character and locally called *athars* are made. They are used for

many purposes, chiefly for covering loaded carts in wet weather. No specimen has been forwarded, and it is doubtful whether they should be regarded as carpets at all. But as some of them show coloured stripes they might be regarded as very coarse woollen *daris*, corresponding to the equally coarse cotton *dari*, the *jhorya* of the Deccan. Male butchers alone are engaged in this work, which is regarded as humiliating. The employment is auxiliary to other means of occupation and is followed in numbers hardly worthy of computation. At Jambusar eight men worked as butchers, and of these two added to their takings by making these carpets. In Broach City wealthy persons buy woollen carpets of small dimensions. These generally come from Agra. In spite of the cotton grown all around little of it remains for local use. It is nearly all taken up by Bombay or Ahmedabad.

Kaira.—Anand and Nadiad alone send affirmative reports, and of these the first is possibly incorrect, while the second refers to an enterprise which is not, strictly speaking, indigenous. No very definite information has been sent from the Nadiad factory. It seems that the goods in most demand cannot be other than of moderate price and quality. Carpets of about three square yards and costing about twenty rupees form the bulk of the local orders. A few Banias in Matar get carpets from Cambay. As a rule most of the carpets are bought in Bombay or Ahmedabad.

The Panch Mahals report is wholly in the negative.

Surat.—Outside the city, carpet-making is not practised. In the city it is limited to the Balashran Mission and the small local jail. Considering that Surat has been a place of wealth and importance and celebrated for excellence in various handicrafts, it is rather surprising how little carpet-making has been done there. But only the most inferior wool is to be had, and nowadays Bombay is a great deal too near for any local enterprise to have much chance of success. The little wool available fetches in Bombay only Rs. 6-8 a maund, a lower price than is paid in jails for the wool out of which convicts' blankets are made. At the Balashran Mission carpet-making is included in the numerous crafts taught to the inmates. The report states that every sort of carpet can be made, and that occasionally silk carpets are produced. The school maintains a dye-house, and the report adds that vegetable dyes are used. From certain samples of dyeing that were forwarded it was apparent that some of the colours were crude in the extreme. The local wool supply is insufficient for the small demands of this institution. A few men of means buy *galichas*, though most are content with *daris* which come from Baroda, Rutlam, Agra, Delhi, Cawnpore, or Bombay. Local wool selected for carpet work costs ten rupees a maund.

Thana.—Among the free population carpet-making is not practised.

Ahmednagar.—On a very small scale indeed Ahmednagar is the Amritsar of this Presidency, though the parallel does not go very far. It exists only in fact in this one respect, that more woollen carpets are turned out of Ahmednagar by free labour than from any other place in the Presidency. Of the city, Hunter

records that it was founded by a cloth-weaver in 1494, and that its *saris* had a high reputation. Among its former industries was the making of carpets of a strong lasting character. In 1880 the industry had died out, and that which has sprung up is of a different character. The fall in price of Bombay-spun yarn so developed the cloth-weaving industry as to absorb all the best labour. The compiler has not been able to procure a specimen of the old style of carpet. They seem to have been cotton *daris* made after the manner of the present *jhorya*, but in a more elaborate manner, somewhat after the style of Navalgund carpets. Formerly the industry was evenly scattered among small proprietors; but now the craft is limited to the small jail, an American mission, and an art school. At the Sir Dinshaw Manockjee Petit Art School carpet-making is included in the curriculum largely because in its practice the advantages of the drawing class are brought home to the workers. Training rather than profit from a monetary view is the main object. An idea of the limited output can be gathered from the following figures. In three years 247 square yards of carpets were turned out, or roughly 82 square yards in a year. By far the commonest width of carpet ordered was 4 feet or a trifle more. Hence only 318 running feet of carpet were made in three years, or 106 feet per annum. Allowing the six working days of each week for each running foot, it is clear that two looms would be sufficient to take all the output. Probably there are many more looms, for in art schools work need not progress at an even rate, teaching requiring many breaks in the advance of the work. But these figures at least demonstrate the small scale on which the work is done. The designs are generally sent from the Bombay Art School. Three qualities of carpet are in most demand, as follows: 144 stitches per square inch Rs. 30 per square yard; 64 stitches at Rs. 15; and 16 stitches at Rs. 12. In fairness to the artistic tendencies of the institution, it is only just to add that of the latter in three years only 15 square yards were disposed of. The second quality is the favourite. Most of the produce goes to America. But the report adds that out of goods valued at Rs. 4,455, the work of three years, only Rs. 1,335 have been realized. Now among carpet dealers, for example the usual Bombay carpet trader, the following simple rule gives the price which he is usually prepared to pay for the woollen carpet of ordinary commerce—the carpet which forms the bulk of the Amritsar trade:—"One rupee per square yard for each stitch per running inch" By this rule if 144 stitches per square inch be taken as 12 per running inch, a square yard of such a carpet would cost the average middleman Rs. 12. From this rule it seems that the produce of the Ahmednagar Art School is priced far above the ordinary commercial rate. This is in accordance with the principle that training and not financial profit is the first consideration. The wool used comes from Cawnpore already spun and dyed. This plan has both advantages and drawbacks which will be more fully comprehended after reading Chapter V on Dyeing. Local spinning and dyeing were both attempted but without success. The report adds that all the Cawnpore-dyed yarn is coloured in aniline or alizarine. The trials with local vegetable dyes failed, partly because separate dyeings rarely matched and partly because raw dye materials were not easily to be had.

The other institution in Ahmednagar in which carpets are made is the Indian Mission Industries Company Limited, under the management of Mr. W. H. Wild.

At the time the above-mentioned report was received from the Art School at Ahmednagar, the Principal was away in America. Since returning, Mr. Smith sent the following note, which is given in full:—

"Carpet-making has been carried on at Ahmednagar for only about seven years. It was begun at the Sir D. M. Petit School of Industrial Arts, where about 450 pupils have been instructed in the industry. The pupils obtain employment in the Ahmednagar Carpet Factory of the Industrial Missions Aid Society.

"The methods pursued in the Petit School are practically those of Amritsar where the head master obtained the practical part of his training. The yarn however is spun and dyed with *vegetable dyes* in a Cawnpore mill. This ensures greater uniformity in the size of the yarn and therefore greater evenness in the pile of the carpet, while the dyeing of the yarn in large quantities in the mill ensures uniformity of colour so often wanting in Eastern carpets. Special shears have also been made for us in Sheffield through which we secure a smoother-clipped pile than is possible with Indian-made shears. Thus far the school has been dependent for patterns upon the various illustrated publications on Indian and Eastern carpets, but carpets from these designs have not been found so saleable in America where Oriental carpets find the best market. The Principal has therefore recently bought a number of the most saleable Oriental carpets from a prominent American carpet house, and hereafter these will be carefully copied. These are all purely Oriental, but they suit the fashion of the day in carpets, and it is probable that different ones will have to be bought in a few years. In the meantime these can be made at a good profit."

From the above it is clear that the Art School carpets are made largely on Amritsar methods devised to meet the requirements of the American market. Designs are modified to enable carpets to fit rooms of specified dimensions without spoiling the design. This part of the work is peculiarly fitting to a school in which drawing is regarded as one of the most important subjects taught, but the writer would expect great difficulty to arise with regard to colours. Either the Cawnpore mill can supply an infinitude of shades, or the carpets must be restricted for the most part to comparatively few stock colours.

Khandesh.—When the Gazetteer was compiled carpets were made at Kasoda and Paldi in Erandol, at Asoda in Nasirabad, and at Ranola in Nandurbar. About 400 families of Dhangar and Manbhav Hindus and Musalman Pinjaris were in all employed. Nowadays there is no carpet-weaving at Paldi. At Kasoda, excepting a single woman, the Musalman Pinjaris alone do it. Only a few people are employed, and of these some are interested in mangoes or cotton in addition. With some, the children assist by unwinding the thread. To start the industry a family of four will need Rs. 50. One carpet of the *jhorya* class can be made daily. Since the famine of 1876 the industry has much decreased, and light carpets imported largely from Madras have replaced the indigenous product which is thick and heavy. The hand-looms in Kasoda number 150. This small community does not get its cotton directly from the local cotton supply which goes at first to the Jalgaon mill, whence it is distributed throughout this part of the Presidency for coarse textile work. The home weaver sells directly in the bazar, but a middleman intervenes if the produce is to be sold outside the village. At Varangaon and Bodwad carpets are still made by Pinjaris whose entire household assists. Formerly the *jhoryas* made in the Bhusawal taluka were

valued at Rs. 2,000 annually, but nowadays Varangaon and Bodwad turn out products to the value of Rs. 500 only. Agra and Cawnpore are destroying the local industry.

In Chalisgaon, Pinjaris fall back on *jhorya*-making when agricultural work is slack For one *jhorya,* a purchase of cotton to the value of Rs. 3 is the only monetary outlay necessary. The purchasers are generally Kunbis, and if no ready buyer is at hand the makers take the goods to Nandgaon or Malegaon.

A few *jhoryas* are still made at Chopda, though most of those bought come from Ranola.

Jalgaon for the most part buys Agra carpets, but a few *jhoryas* are made at Nathan and Panaskhed. These are not only coarse and thick but are at times mapped out roughly in flowers and squares.

In Nandurbar, men and women at Ranola, widows alone at Nandurbar itself, make *jhoryas.* For the men this is but auxiliary employment. They buy the thread and sell the produce at the large local fairs, such as Hingla-devi, Navapur-peta, and Sarunkheda. The industry maintains its position of comparative obscurity.

Twenty-five years ago *jhoryas* to the annual value of Rs. 2,000 were made, but now the value has dwindled to Rs. 500. At Shahada and Sindkheda a few *jhoryas* are made. In Yawal, *satranjis* in simple colours or plain, as well as *jhoryas,* are made at Kingaon and Mahalkhedi, where a few families totally subsist by this industry.

Nasik.—Hunter makes no reference to any kind of carpet-making in this district, whereas the Bombay Gazetteer of 1884 contains, on page 169 of the Nasik volume, a somewhat lengthy account. The articles referred to are evidently the *jhoryas* so frequently mentioned in preceding pages The writer of the article in the Gazetteer evidently regarded *jhoryas* as carpets. They are in fact *daris* of the most elementary character possible, and form a convenient beginning to a series of fabrics which culminates in the elaborate and artistic products of the Yeraoda Central Prison *dari* factory.

In 1883 fifty families found full employment in carpet-making. To-day a single individual, a beggar, spends his leisure moments after harvest is over in this work. He lives at Dahivohol in Malegaon. Three years ago he was helped by his brother and son, now both dead.

Poona.—Except within the Yeraoda Jail only two persons in the whole district know how to make carpets, and that knowledge they owe to enforced education within its walls.

Satara.—No carpets are made in this district. A few persons in Khanpur own carpets of correct Eastern design. At Tasgaon the many *satranjis* used come from Sholapur, Advani, and Amraoti At Walva the smaller inferior sorts come from the Madras side, the larger superior sorts from Agra. Brahmins during worship use small mats woven in pile. These come from Vategaon in the Kurundwad State.

Sholapur.—The wool of Sangola is too coarse for carpets, though the many shades in colour available suggest the making of natural wool carpets. The local blanket-weaving industry takes up all the wool. From 1901 till 1905 the Reverend Mr. Gates maintained a small class of lads whom he engaged in *galicha*-making. Eventually from many causes the reverend gentleman decided to abandon the class. Among other factors the price asked for the goods, though barely covering expenses, was deemed too high.

Belgaum.—Both past and present reports from this district are contradictory, as possibly doubts exist whether certain locally produced fabrics are carpets. The Imperial Gazetteer makes no mention of carpets. The Bombay Gazetteer quotes Belgaum, Bail-Hongal, and Mugatkhani Hubli. The description of the loom indicates a real carpet, and the terms used are in Northern India applied to carpet-making. They are locally known as *jemkhanis*. At Gokak they are made in fifteen villages, each village having three or four looms. Of carpets the Collector reports that none are made, so that probably these fabrics should be regarded as cloths. But whatever their real classification, they seem to be of very coarse construction—a feature of most village products nowadays. The carpets in use generally come from Bellary

Bijapur.—In 1884 carpets were made at Bijapur, Kohlar, Ilkal, and Sulibhavi by fifteen families of Musalman weavers. About 300 carpets valued at Rs. 2,000 was the average annual output. The workers were hardly better off than unskilled labourers, and in the famine of 1876 repaired to the earthworks. Cotton carpets were made thirty years ago at Bagalkot by a Musalman. At the present time at Kohlar seven Musalmans own three looms, at Bijapur town three families are employed, and at Sindgi the same number. A carpet of about 30 square feet costs Rs. 9-10; of 20 square feet Rs. 5. These are all made of country cotton in coloured threads. From the Jath State villages, and to a less extent from the vicinity of Bijapur, come sheep-wool mats in black and white.

The Bijapur town carpets are made in any length or breadth, in dark or light blue stripes with red and white intervening. They are sold by weight and are made after the manner of *sari*-weaving

The Sindgi *gudhars* generally consist of ten strips of about 11 inches in width and 15 to 18 feet long, sewn at their edges. One strip occupies one man a whole day.

In the Bijapur taluka the following villages are concerned with carpet work: Sarwad, Mandapur, Dewargennur, where Lingayets and Jadars do the work—the men weaving, the women cleaning the thread. At Torvi, Babarnagar, Kanamdi, and Ghonasgi, thick carpets, nearly square, are made; they are frequently placed on horses' backs.

Dharwar.—Hunter refers to the fine cotton carpets made at Navalgund. The Bombay Gazetteer refers to the industry at page 378 of the Dharwar volume. The Mamlatdar has sent an interesting report:—

"There are now about twelve looms at Navalgund, and the fabrics made are undoubtedly carpets. Vertical looms are employed, as generally used for *galichas*.

No shuttle is used, the weft threads being passed by hand. Generally, the carpets measure 4½ by 9 feet. Such a carpet costs Rs. 8-9. If permanent colours be ordered, the cost will be Rs. 1-4 a square cubit as contrasted with a cost of 8 to 12 annas for inferior colours. One man can weave in a day a piece half a cubit in breadth by one and a half cubits in length. To put up the *than* will take ten or twelve days (?) and the weaving of each carpet requires two men."

By request, the Mamlatdar expresses an opinion as to whether *gudhars* as made in the vicinity are carpets or not. He remarks:—

"The ordinary *gudhar* is assuredly not a carpet. In making them, horizontal looms are used, and the chief characteristic that differentiates a *gudhar* from a carpet is that in the former yarn twisted very hard into threads is used as the warp, but in the latter comparatively loose yarn is used for the same. And the quality of a *gudhar* is estimated by the degree of impermeability to rain. The weaving in the case of a highly finished *gudhar* is so nice and perfect that if water be poured over it not even a drop will pass through."

In commenting on the above, it should be noted that the horizontal loom, the tight twisting of the warp threads, and the fine weaving, are all found in connection with *daris*. The real grounds for regarding *gudhars* as being different from carpets seem to be: (*a*) they are made in strips; (*b*) a shuttle is used; (*c*) they are used to protect grain from falling rain. But as regards fineness of weaving, the writer has seen *gudhars* superior to many *daris* of elaborate design.

A small sample of modern Navalgund work was supplied. Although it is owned that modern work is inferior to earlier efforts, Navalgund can still claim to produce far better *daris* than any other place in the Presidency proper, if only purely village work is concerned. Indeed, it might almost be said that if a strict definition of carpet be adhered to, and nothing be called a carpet which is not used for spreading on floors, then, apart from the prisons, a few art and industrial schools, and a factory or mission here and there, pure carpet-making does not exist in this Presidency.

The great defect of modern Navalgund carpets is due to the colouring. A very bad yellow of vivid hue now largely mingles with the reds and blues of the older styles. If this defect could be remedied, the Navalgund *dari* would be quite a fair sample of cheap village work. Unfortunately there seems no possibility of increasing the daily output by any mechanical method, for the hands alone can weave the diagonal lines with which the design abounds. Hence it is not unlikely that the competition of other cheaper forms of *dari* will press heavily on the Navalgund industry. The report does not mention any decline in the extent of the industry, but a mere dozen looms do not indicate a large trade. Still such as it is, it remains in the Presidency proper as the only example of a village industry in real *daris*. All the others—*athars*, *jhoryas*, *jemkhanis*, *gudhars*—are merely *dari*-like fabrics made by peasants from the cheapest materials and used for very rough purposes—a case rather of the survival of the unfittest. The Navalgund *dari* alone rises above this classification. Formerly carpets were made at Hubli and Dharwar, though such is not the case at present.

Kanara, Kolaba, Ratnagiri.—From these districts, in which no raw materials for carpet-making exist, negative reports have been sent.

The Province of Sind.—Sind has always had a reputation for carpets, though not altogether of an enviable character, for Sir George Birdwood refers to the goods as the coarsest of all Indian carpets, and most other writers mention them in the same spirit. But the actual amount of carpet work done in spite of a decrease in recent years is still much larger than most persons resident in the Presidency proper realize. The industry is scattered about among small units and needs much searching.

If Sind carpets as a whole possess any marked features, they are these—the weaving is very coarse and the dyes are generally good. The more thoroughly any single carpet is the work of purely village labour, the better are both weaving and dyeing, especially the latter.

Karachi.—Former records mention only Bhubak as making carpets. This place now forms part of the Larkhana Collectorate and will be mentioned at length in that connection. The current returns are restricted to the following. In Kohistan a rough kind of carpet called *khirir* is made by the women only, of whom not more than fifteen to twenty are so employed. When they die off the industry will vanish, the younger generation knowing nothing of it. The carpets form part of the wedding dowry. The women so employed are Brahuis. *Farasis* are made at Makan Malhand by Lasharis, Maris, and other hill tribes settled at Mirpur Batoro, the women in this case too doing the work. Only about twenty-five persons in all are now so engaged when agricultural work is slack. The *farasi* work is declining owing to the enhanced price of wool and lac. The carpets are sold at local fairs. The residents of Shahbunder and Tatta buy in Karachi carpets made at Bhubak, Amritsar, and other Northern Indian towns as well as from the Persian Gulf. Hair carpets made in the Sakro taluka and at Bulla Khan are also in demand.

Hyderabad.—Neither the Imperial Gazetteer nor Hughes' Gazetteer of Sind mentions any carpet-making here except in the jail. The current reports include many references to small industries scattered as follows :—Women make carpets at Khakri, Mango Tetri, and at Oman near the Khairpur Territory in the Naushahro division. The women are Maris or Khashkelis. The Oman industry is decidedly on the increase. Although in the larger towns of middle and lower Sind many carpets made in Northern India or Bhubak can everywhere be found, still the indigenous industry of Tetri-Oman is quite able to hold its own. In a few villages of the Guni division, Mari, Lashari, and Nudani women make carpets in addition to attending to house-work. But with them materials are getting costly and the work is declining in quality. The produce is sold at fairs in the Tando division. At Hala a few Mari women make *farasis* in their spare time. Formerly *farasis* priced at Rs. 20 each were made, but now this is uncommon. At one time in the Hyderabad taluka hair *farasis* were made. During the last twelve years the industry has almost died out. The *daris* made in the Kandiaro division bring little profit, for after two months' work a carpet selling for ten rupees yields only three rupees as profit. Not more than forty persons in all give their spare time to this work. In Sakrand both *farasis* and *khirirs* are made. The former are made by Mari women only; the latter

by men and lads. About fifty persons are employed at an average outlay of two rupees a head. The industry holds its own and has done so for years. The *khirirs* of Tando Allayhar are made of goat-hair and jute, though the products of Guni, Mirpurkhas, and the Naushahro villages are preferred. A special reference is made to the city of Hyderabad, as the writer has had unusual facilities for learning to what extent carpets are used by most Sindhis. While large carpets such as would certainly be spread on floors, are only found in the houses of those in easy circumstances, small carpets approximating to the dimensions of a cot are found everywhere. They form part of the bed-covering on top of which the recliner rests. In Hyderabad City itself they are particularly abundant, and among the Sindhi Workis, as the traders in Indian and Eastern products are called, the varieties are numerous indeed. But while the owners can appreciate good weaving, their ideas of good colours seem, at any rate to Occidental eyes, crude in the extreme. The carpets come from many sources. Bhubak and Mirzapur are recognized at once by the extreme coarseness of the weaving; carpets from the Persian Gulf *via* Karachi by the modified prayer-carpet design and characteristic colouring; a few heavy shaggy Mooltan carpets can be seen, or a strong jail carpet made some years ago when prices were lower. The best probably come from Amritsar, as special orders, but such are few in number. Among the stocks held by the Sindhi Workis as part of their merchandise are some really good carpets made generally in Western or Northern Persia. The indigenous products are not in much demand. They are really quite as good as many of the carpets from Northern India held in much greater repute.

Sukkur.—Most people have regarded Shikarpur as a carpet mart rather than as a carpet factory; but Hunter's list of local products includes carpet-making, while the far longer list of articles passing through omits all mention of carpets. At the present time the carpet industry of Shikarpur may be said to exist inside the jail only. During a recent visit to Shikarpur a prolonged search failed to reveal carpet making, good designs or good carpets generally, nor was there much evidence that many carpets entered Shikarpur *via* the Bolan. Not a single really good carpet was discovered in the ordinary way of searching. Fortunately the Civil Surgeon, Dr. Bocarro, who gave every assistance and was most enthusiastic on the subject, was able to discover among the property of quarantined travellers some good samples of Baluch carpets. The goods exhibited in the bazar come mainly from three sources: (*a*) From the Persian Gulf. The exact route taken by these goods is not quite clear, but most come through Bombay dealers and the rest through Karachi. They are identical in design and texture with the carpets sold by Bombay merchants as Persian carpets. The prayer-niche design, often much modified, prevails. (*b*) Carpets called 'Kirmanshah' are shown in great numbers, and bear scanty resemblance to the older products of Kirmanshah. The design varies very little and consists mainly of roses woven in regular rows throughout the field, the rest of which is filled with a tangle of intertwining branches and foliage. The red of the rose petals is very vivid, and in every way the article is very inferior. How near any of these carpets have ever been to Kirmanshah is quite unknown to the writer. (*c*) Baluch and similar carpets. These include many varieties—the *farasis* and

khirirs of Upper Sind, the carpets known to all Quetta residents as Baluch carpets and Bokharan carpets. These latter are very abundant in the bazar, though only very inferior specimens reach Shikarpur. Probably nowadays, of all carpets made east of Herat the pure Tekke Turkomans are the very finest, and the articles shown in the Shikarpur bazar as coming from Bokhara are really very inferior and almost unrecognizable attempts at good Tekke carpets. In addition to the above classes there is a residuum of carpets coming from all over Northern India. Agra, Amritsar, Lahore, Mooltan, Mirzapur, and Bhubak are all represented—the last three by the worst carpets of all. Obviously Shikarpur is still a carpet mart, though connoisseurs searching for good fabrics will wisely pass it by. The local carpet-making of the entire Collectorate calls for no remark.

Larkhana.—Jamalis and Shahanis of both sexes in the Ratodero taluka make carpets, should abundant grazing render attention to the flocks needless. This small industry is interesting, inasmuch as the carpet-weavers also produce the raw materials throughout, and moreover avoid aniline in the colouring. In a modest manner therefore it approaches a nomad style of work. A few women at Mehar make carpets, and as the raw wool is finding a better market elsewhere the industry is decreasing.

The following account briefly describes the Bhubak industry at the present day:—About thirty men and women in all are employed. The trouser-cloth industry engages one hundred. Rs. 1,500 are invested in carpet-making compared with Rs. 2,500 on trouser-cloth. Owing to a rise in the price of wool the enterprise has of recent years declined. The Musalman workers receive advances from their Bania creditors who take over the entire output. Each worker earns not more than four annas, and at that low earning capacity all the able-bodied take to agriculture. In a year about two hundred carpets at ten annas a square foot or less are turned out. The demand for carpets at that low rate exceeds the output capacity, as few are willing to work for so low a wage. Aniline dye prevails everywhere.

The above account was borne out by a personal visit. Dr. Bocarro, the Superintendent of Shikarpur Jail, visited Bhubak and remarked as follows:—

"I cannot say I was favourably impressed either with the workmanship or the colouring of the stuffs, though in justice to them it must be mentioned that some of the designs were very handsome. When it is stated that these famous Bhubak carpets are made on a warp with 14 to 16 strands of coarse cotton yarn apparently of No. 6 count with a weft equally thick . . . . it may be readily understood that the texture of the resulting product can scarcely be either superior or durable. The time taken in the completion of one of these carpets, say a piece seven feet by four, compares favourably against jail-made articles, for I was informed that at one carpet one man will work and make six to seven inches, whereas two convicts in a day of equal length will do fewer inches. Area for area, a Bhubak carpet will cost Rs. 18, whereas a Shikarpur Jail carpet will cost over Rs. 42."

A personal visit to Bhubak confirmed the above in every respect. A resident who acted as guide but who made no pretence to any knowledge of carpets pithily (and accurately) remarked that the great fault in the local carpets was that they contained too much 'stuffing.' No good carpet contains more

than three rows of fine *poth* between each row of pile; the Bhubak carpets contain as much as eleven rows of very thick *poth.* Consequently a close examination reveals the fact that at the time the carpet leaves the loom one half of what looks like pile is really weft, and that much of the carpet is really only blanket work. The entire industry is in the hands of two or three Banias, of whom one controls most of the industries in the place. Aniline is used everywhere; indeed the very babies had it smeared over their faces! The carpets are in two grades known as 'superior' and 'middling,' or, as they should be called, 'bad' and 'very bad.' The better sort sells at twelve annas, the inferior at ten annas, a square foot. Only three designs were shown, of which one, reserved for the better class, rejoices in the designation of Iranian and consists of a tree-form with leaves and flowers. It bears just the faintest resemblance to certain forms of Persian carpet design. The two other designs are of hybrid character.

From the above account it is clear that, as regards quality of work, Bhubak is continuing its downward career. The industry owes its survival to the proximity of the Muncher Lake on the edges of which flocks of sheep find good grazing. The wool derived from them is better than the general wool supply of Sind, though the quantity available fluctuates very much. It is believed in Bhubak that the weavers are descendants of a slave family brought from Persia; except as regards the superior design, the patterns show no trace of Persian influence. Each weaver too seemed to literally have the design at his finger-ends and needed no instructor to call out the colours. The children seem to learn these few designs like most children learn their alphabet, and possibly they would not exchange their lot if they could. There was a marked tendency to keep back information at first as if unwelcome innovations might in some curious manner result from any free giving of news.

Chandias and Brahuis from the Kelat State descend to the plains for labour when there is drought in the hills. Their women make a few carpets in the Nasirabad taluka. One old woman of seventy asserted that when a girl is born the mother commences making a carpet which becomes the mother's wedding gift when the girl is married.

Upper Sind Frontier.—Around Jacobabad and Thul woollen carpets are made. Women of the Jekhrani caste do the work at the former place: and at the latter, Brahuis and a few Burdis come down from the hills in the cold weather for the work. A few of the carpets made of the best material and dye are to be had, but such carpets are not however intended for sale as they form part of the wedding dowry. A few can be had by paying Rs. 40 to 50 for a carpet 7 by $4\frac{1}{2}$ feet. At present the entire industry is on a very small scale.

Thar and Parkar.—A few *farasis* are made at Sinjhoro and Sanghar. From Umarkot it is reported that there are hardly ten looms in the whole taluka, and at the most thirty *farasis* are made annually. The great extension of cultivation in this part of Sind accounts largely for the decline in the industry.

The Bombay School of Art.—Mr. Burns, the Principal of the Art School at Bombay, sends the following remarks:—

"1. With the exception of the carpet-weaving class in the School of Art, Bombay, which is mainly carried on for the purpose of instruction, no pile carpets, as far as I am

aware, are made in Bombay City. The reasons for this are two-fold—firstly, the average rate of wages in Bombay, owing to the demand for labour in the mills, the docks, and in the building and engineering trades, is too high to enable the industry to be carried on at a profit; and secondly, the raw materials, with the exception of the cotton warps, have all to be imported from considerable distances.

"2. Only occasionally is a large carpet made at the School of Art, as for teaching purposes such a work is comparatively useless.

"The mere mechanical action of knotting the pile threads of wool to the warp can be acquired in a short time by children, women, and young boys; and to train such persons to do this work, while there is no factory in Bombay at which they can obtain future employment, is a waste of time on their part, of effort upon that of the staff of the school, and of Government money. Experience has shown that workers trained in Bombay will seek employment in other industries or modes of gaining a livelihood in this city, rather than migrate to other centres where carpet-making is carried on as a trade, but where wages are lower.

"3. The carpet-weaving class at the School of Art therefore is maintained for the purpose of giving higher training to young craftsmen sent from the centres where a living industry exists. These men already possess a knowledge of the rudiments of the craft, but enough weaving is practised to keep the student's hand in training; but, as will be seen, the greater portion of their time is taken up in learning the artistic side of their craft.

"The subjects taught are:—

Drawing	6 hours per week.	Dyeing	9 hours per week.
Design	6 do. do.	Weaving	24 do. do.

"4. The system of teaching Drawing and Design is as follows:—Upon one day the student draws a flower or leaf brought in from the School garden: on the following day he copies the design of an old carpet: on the third he learns simple geometry. When he has attained a certain proficiency in these subjects, he is shown how to apply geometry to design, by repeating and combining the various geometrical figures he has learned to construct. He then makes a geometrical design for a rug on squared paper, to be woven with a given number of threads per inch, in two colours, and his design is carried out by himself and another student, each alternately weaving and reading.

"In the advanced section the student is shown how to arrange the flowers he has drawn in class into a design by repeating their form on a geometrical basis. He thus comes to understand the two bases of all design, Geometry and Nature: his taste in the combination of colours is trained by the study of old models: and he is taught to dye the wool a good local colour according to the old methods.

"It is useless under this scheme to weave large carpets each of which will take three to six months to complete, giving little or no scope for demonstrating the practicability of the designs prepared in the class.

"Instead, rugs, varying in measurement from 4 feet by 2 feet and 8 feet by 6 feet, but rarely exceeding 12 by 8 feet, are woven.

"5. The importance of designing with a view to the number of threads per inch used in the rug is especially enforced, this being a point to which ordinary craftsmen, and even manufacturers, rarely pay attention. I have seen numerous instances where attempts have been made to reproduce patterns, originally woven with 144 or 256 threads per square inch, in rugs woven with counts as low as 64, and in one instance in a rug of 16 counts: naturally the design was completely spoiled.

"6. Particular attention is also given to the re-casting of old designs to enable their being employed in carpets of different proportions to the originals.

"Carpets to fit modern rooms in Europe are not as a rule of the same proportions as regards breadth to length as the older rugs, which are generally longer and narrower than those in modern demand. As a result of want of knowledge of design, one constantly sees fine old patterns completely spoiled by the arbitrary omission of important features and the alteration in the scale of details and of borders.

"Practice therefore in this direction, especially in the absence of any original designers in India, is very important to those likely to have charge of carpet shops where the main dependence for patterns is in copying designs of a past period.

"7. It is impossible to say what opportunity the young craftsmen, after leaving the school and returning to their native places, have of applying the knowledge they have acquired; but that they are very much better workmen and are more fitted to take charge of carpet shops is beyond doubt, and has been testified to by Mr. Smith of Ahmednagar in the instances of boys from the Sir D. Petit's School of Industry who have finished their training at the Bombay School of Art.

"8. In reference to the industry as a whole, there is one point which is not understood by the majority of those who are admirers of the ancient Oriental rugs, who are anxious to see the industry flourish in India but who are not practically acquainted with the basis upon which the trade has to be carried on.

"This point is the vital one of supplying carpets suitable both in design and colour to meet the requirements of not only the Indian market but of that of the world. Were there no imports of machine-made rugs into India, it is doubtful if the demand for pile carpets in this country would be sufficient to create a very prosperous or widely spread industry; but under existing circumstances it is fairly safe to say that the main support of the trade is in its exports.

"Although the strong and rich schemes of colour found in the finest examples of Oriental rugs are suitable for certain styles of furnishing in Europe and America, they are quite out of harmony and keeping with others. In a hall or dining room, wainscotted with oak, or wherever a low-toned scheme of colour is employed, they fit in with their surroundings admirably; but in a drawing room or a boudoir of Louis XV or Adams period, where the walls and furniture are delicate in colour and texture, they are quite out of place and will not be adopted by any decorator of taste.

"9. To meet this failure on their part, carpet manufacturers in India have translated the designs copied from the old carpets into pale colours which, in every instance I have seen, completely spoiled the design and have given the carpets a washed-out and sickly appearance, in which all the effect of the masses has been lost. The reason of this is that the design was made purposely to be carried out in the forcible colours of the original, and the masses would have been arranged differently had it been designed for a paler scheme as were those of the delicate carpets of the eighteenth century manufactured in Europe. Until there arises in India a class of professional designers such as are at the service of the manufacturers of Europe, these debased copies of old work will be all that India can offer to meet the demand for carpets in pale schemes of colour, and the industry will show the same lack of vitality and tendency towards progress and development which now characterizes it. In the meanwhile a certain amount of good might be done by Government establishing, at an institution like the Art School, a Design Studio, into which some of the best pupils from the carpet-weaving class previously referred to might be drafted. From this studio, new designs in colour might be issued at regular intervals. The designs issued would be based upon geometrical or natural forms indigenous to India and would also include re-arranged versions of many of the old patterns thus making them suitable for modern requirements. If these were distributed among the manufacturers of carpets throughout the Presidency, and to the house-

furnishing firms in England, America, and in India, with a few notes attached regarding the style of decoration with which they are intended to harmonize, together with the names of the manufacturers from whom they could be obtained, I think there can be little doubt but that a considerable stimulus would be given to the industry throughout the country."

Carpet-making in the Bombay Prisons.—The carpets made by convicts most certainly exceed both in output and general high standard of excellence those turned out anywhere else in this part of India, their only possible rivals being the very few pile carpets made from time to time by special order at the Bombay School of Art. The writer saw one such carpet while visiting the School. While however it would be rash indeed to assert that any Yeraoda carpets excelled it in any way, it must be conceded that for every one carpet made at the Art School, the Jail factory will turn out in the year a dozen fully as good, while all the rest of the Jail output is not far below the same high standard. Nothing bad is allowed to leave the Jail factory, while every endeavour is made to attain to as high a standard as is possible under the conditions of convict labour.

The following list gives in general order of merit the jails in which carpets are or have been made to any noteworthy extent—Yeraoda *facile princeps,* Shikarpur, Thana, Karachi, Hyderabad (Sind), Dharwar, Bijapur. Almost every jail however makes *daris* of sorts. Mention will only be made of the Yeraoda, Shikarpur, and Hyderabad (Sind) factories with which the writer has personal acquaintance.

Yeraoda.—The carpets made in this prison are beyond all comparison better than those of any other jail in this Presidency; and indeed among the first four jails in the whole of India it would be hard to state just what place Yeraoda would occupy. All its rivals are far better placed with regard to raw materials, so the prison may well be pleased with the position it holds. Since the work of printing enormous quantities of official forms has engaged many of the convicts, the carpet industry at Yeraoda has been somewhat handicapped, though it has always been found difficult to maintain the supply of skilled carpet weavers. As a rule about twenty-five large high-class carpets are turned out each year, a number which could be increased by one-half if only convicts could be found for the work. At present fully a dozen looms are always in use. Formerly, before printing absorbed so many workers, eighteen looms would generally be in use on most days. There has been no falling off whatsoever in the call for Yeraoda carpets. The one point which customers dislike is the very long time it takes to get a carpet made. These remarks apply to the woollen carpets. With regard to *daris*, Yeraoda is absolutely without a rival, as was evidenced by its success at the Delhi Exhibition. The call for high-class *daris* is limited by the labour available. In one respect Yeraoda has a great advantage over the other jails, and indeed over most carpet factories. The supply of patterns is particularly large and also very true to old original designs, of which some are now very rare. It is a fact that many of these designs are rarely called for, but the colours exhibited in the patterns have always been very useful in training the workers in the dye-shed in the all-important branch of dyeing. The total exclusion of aniline dye is a more difficult task than most people realize, though Yeraoda has undertaken it ever since its erection.

Most of the references to processes and factory details in later chapters are based on Yeraoda practice.

Shikarpur.—This prison has always been famous for its carpets which for the most part were correctly copied from genuine Persian designs. The art of dyeing was, till the inrush of aniline, carried on with great skill by the Shikarpuris, while all the tribes around, from among whom most of the convicts came, were acquainted with the dyer's craft. Dr. Salaman, for many years in charge at Yeraoda, was formerly Superintendent at the Shikarpur Jail, and although the evidence is not conclusive, it would seem that on his transfer he must have taken with him from Sind the best of the patterns. He spent time, money, and trouble without stint in this search for patterns to the lasting gain of the Yeraoda factory. Of the patterns remaining at Shikarpur few are of interest. Certain of them are illustrated in this work.

Hyderabad (Sind).—For pile carpets there are two large looms only, a number which Shikarpur can exceed by six or seven. The pile carpets produced are thus few in number, but of late years an attempt has been made to greatly improve their quality. This factory however, in common with all the rest excepting Yeraoda and Shikarpur, is badly off for patterns. Thana has a large variety, of which most are copies, and not good copies, of Yeraoda work. The importance of excellent copies will be referred to later. The Ahmedabad Central Prison makes practically no woollen carpets.

Native States.—The Native States with a few exceptions possess no pile carpet industry, though the writer is inclined to regard the *dari*-making done by them as being on the whole above the average in the matter of weaving, while there is no doubt whatever that the dyeing is correspondingly bad. All the *daris* are of small and narrow dimensions, and as shuttles are used, the work falls rather under cloth-weaving pure and simple. No attempt has been made to communicate with all the Native States, but the following among others sent replies :—

Baroda.—Carpet-making is nowhere carried on to any appreciable extent in the State outside the Central Jail where only *dari* work is practised. About seventy prisoners in all are so engaged in making *daris* of all ordinary sizes ranging in price from 11 annas 3 pies to 3 rupees 6 annas per square yard. These prices in square feet are approximately 1 anna 3 pies to 6 annas respectively. The design is generally geometrical. Men are also trained in making pile carpets, for which the demand is very small and the profits limited. The jail made some good pile carpets for the palace with 108 stitches per square inch and with wool ready dyed at Amritsar. It possesses a dye-shed where wool can be dyed with chrome developing and alizarine colouring.

The celebrated Pearl Carpet of Baroda, which aroused so much interest at the Delhi Exhibition, is a piece of pure embroidery, and as such calls for no reference here.

Cambay.—A brief reference to the Cambay carpets of the past will be found in the Historical Sketch. *Satranjis* or cotton carpets are now made at Cambay, principally though not exclusively by Mahomedans of the male sex. With many it is only an auxiliary means of employment. It is now a reviving

industry engaging 56 fly-shuttle looms which are attended by 68 workers. The old looms are useless for this work. For the uninitiated it is added that the fly-shuttle loom has adjusted to it a simple mechanism whereby the shuttle is rapidly thrown from side to side and the comb with almost a synchronous movement advances or recedes. For comparison it will suffice to add that a man who with an old loom can turn out nine yards of work can in the same time turn out nearly twenty on the improved looms. It is on account of this possibility of an increased output that the industry is looking up. To proceed with the report: The State is interesting itself in the establishment of these fly-shuttle looms. The old thick carpets are not in much demand. A thin new-loom carpet sells at one anna a square foot, the older capets at two and a half annas or more. It is not clear how carpet-weaving came into prominence in Cambay, but the Tais, a class of professional weavers, have been settled there for many years. These people are now encouraged by the State in fly-shuttle working and in dyeing, the State maintaining a dye-house. The local produce goes even as far as Africa through the agency of Boras.

Khairpur.—The Khairpur State possesses in the Ali Murad Industrial School a particularly efficient institution, and the manner in which it trains lads in carpet making is a striking example of the great utility of such schools. The Vazir of the State, the Honourable Sirdar Mahomed Yacoob, conducted the writer during a complete inspection of the carpet factory. Some of the designs were copied so exceedingly well that at the writer's suggestion several of them were photographed on large plates and are illustrated in this work. The only radical fault with these carpets does not appear in these monochrome plates—the dyeing is very far from good. It was explained that in the first place pile carpets cost no inconsiderable sum in their making; secondly, vegetable dyeing adds very much to the cost as well as to the trouble of manufacture; thirdly, most of the purchasers if anything prefer the vividly bright colours. Apart from the colours the work is excellent, and especially the fidelity with which even delicate intricate forms are reproduced. An efficient teacher supervises the class, carefully recasting the design on square paper whenever necessary, so that the errors of recopying referred to by Mr. Burns are avoided. To what extent the lads themselves can recast designs, the writer forgot to ascertain. Nevertheless the preëminence of drawing lessons is fully recognized, for no lad, no matter in what department he may be interested in, misses the drawing class. They are for the most part quite young boys with hands and fingers capable of very rapid work. The writer was shown the silk carpet intended for presentation to the Prince and Princess of Wales during the last royal tour. For this work an instructor was specially procured from the Punjab (Bahawulpur?), and under his instructions the lads wove this silk carpet which is represented on Plate XLV. It is a very excellent piece of work, but like most silk carpets it fails to convey that feeling of superlative luxury traditionally associated with such fabrics. Though there is certainly too much yellow in the colouring, yet the actual weaving and the correctness of the design are worthy of all praise.

Nearly every Native State, excepting the smallest, possesses a jail in which *daris* are made in such low numbers that the industry warrants no further reference here.

Bombay City.—The Collector of Bombay adds in a later report that he has unearthed in Bombay City one solitary pile carpet factory, and rightly adds that such may be safely disregarded as evidence of any real industry.

Customs Returns.—There remain for consideration figures supplied by the Commissioner of Customs, who kindly furnished a large mass of figures needing much collating, of which a summary may be given very briefly. In the present Monograph figures have throughout been ignored as far as possible, for, firstly, the numbers are too small for conclusions; secondly, a correct interpretation is impossible without most exact collaboration and classification; thirdly, only statistical experts know how to interpret results. Unfortunately the figures relate to the whole of India, and it is not possible to sift from the whole the Bombay portion. They however denote certain tendencies.

STATEMENT A.—EXPORTS *via* BOMBAY.

(Bracketted figures denote exports to the United States of America.)

Year.		Weight in Lbs.		Value in Rupees.	
1894-95	...	241,959	(16,652)	3,58,472	(42,925)
1895-96	...	288,549	(43,643)	4,02,503	(97,704)
1896-97	...	324,400	(60,037)	5,05,663	(1,42,179)
1897-98	...	404,158	(97,241)	6,33,901	(2,28,108)
1898-99	...	412,513	(136,534)	8,35,401	(3,34,402)
1899-00	...	510,752	(214,388)	10,33,491	(4,71,200)
1900-01	...	638,353	(326,067)	12,40,179	(6,93,815)
1901-02	...	629,070	(384,428)	12,18,722	(7,94,926)
1902-03	...	551,529	(282,426)	10,36,177	(6,60,533)
1903-04	...	489,733	(241,147)	8,74,095	(4,93,971)
1904-05	...	404,128	(175,159)	6,95,115	(3,77,193)
1905-06	...	433,548	(179,192)	7,16,657	(3,73,574)

The above figures indicate the extent to which carpets and rugs of Indian manufacture leave for foreign countries *via* Bombay. The figures in brackets supply a useful piece of information, namely, exports to the United States of America. Now all jail-made goods are forbidden entrance to the States, hence any tendency to increase during a series of years in the non-bracketted figures might denote a general development in convict as well as free labour, but the bracketted figures exclude convict work and indicate free labour only.

STATEMENT B.—IMPORTS.

(Bracketted figures = brought in from Persia.)

Year.		Weight in Lbs.		Value in Rupees.	
1895-96	...	78,127	(8,711)	87,260	(10,859)
1896-97	...	122,430	(7,569)	1,62,352	(10,274)
1897-98	...	51,549	(9,391)	57,300	(11,238)
1898-99	...	83,807	(3,285)	1,08,496	(3,590)
1899-00	...	138,503	(6,173)	1,72,795	(9,404)
1900-01	...	188,829	(17,414)	1,98,739	(23,915)
1901-02	...	195,196	(19,508)	2,23,250	(27,015)
1902-03	...	176,780	(30,222)	2,06,199	(46,787)
1903-04	...	236,236	(18,967)	2,68,656	(31,636)
1904-05	...	336,305	(17,645)	3,63,835	(33,287)
1905-06	...	360,905	(33,972)	4,05,133	(56,975)

These figures refer to carpets and rugs imported into India through Bombay—the bracketted figures dealing with additional carpets coming in from Persia, the non-bracketted figures to produce from European countries.

Studying these figures it is clear that whereas in weight exports rose steadily from 1895, they reached their zenith in five years and fell half way back to commence rising again last year. Imports from European countries, starting at one-third the export weight of ten years ago, have steadily increased, till last year they came to 36/43 of exports. Turning to prices in contrast with weights, it is found that, on the whole, carpets leaving India have steadily maintained the same rate per pound, though in 1900, when the demand was at its height, each pound cost almost exactly two rupees: the general price was about one rupee nine annas. With imports, except during 1895, prices have remained very steady, averaging one rupee three annas per pound. But these figures give no criteria of merit for the undoubtedly thin light European fabric works out far cheaper per square foot. Unfortunately there is no means of ascertaining the average dimensions of the carpets passing through the Customs other than the rough test of measuring the most common exhibits at carpet emporia.

STATEMENT C.—IMPORTS IN RUGS AND CARPETS SINCE 1895 FROM THE UNITED KINGDOM AND FROM GERMANY.

For comparison with Statements A and B.

Year.	Weight in Lbs. Great Britain.	Weight in Lbs. Germany.	Value in Rupees. Great Britain.	Value in Rupees. Germany.
1895-96 ...	76,684	477	85,026	1,003
1896-97 ...	119,685	420	1,58,051	716
1897-98 ...	50,384	430	55,857	1,036
1898-99 ...	82,297	982	1,05,941	1,850
1899-00 ...	131,233	3,201	1,60,806	5,740
1900-01 ...	179,701	4,010	1,87,619	6,523
1901-02 ...	187,497	5,401	2,10,151	10,124
1902-03 ...	163,323	10,039	1,85,150	15,859
1903-04 ...	209,432	25,776	2,36,374	30,370
1904-05 ...	296,452	30,242	3,15,283	36,724
1905-06 ...	303,554	46,920	3,38,435	56,204

Statement B studied with Statement C indicates that Great Britain and Germany between them are responsible for practically ninety per cent. of all the rugs and carpets coming from Europe, and that during most of the last ten years the United Kingdom brought ten carpets for Germany's one in the Indian imports. It will be observed that Germany's development has been far more rapid than that of the United Kingdom. These figures however do not prove that the goods sent out in British vessels were by any means necessarily made in Great Britain. There is no marked difference between the cost per pound in the two series of figures, especially during the latter half of the ten years. Germany's goods have cheapened somewhat to approximate to the cost of the others.

The general conclusions to be drawn from these figures are that of the trade passing through Bombay both exports and imports have increased, and that the growth in the latter has been continuous whereas that of the former has fluctuated.

The relative increase has been much larger than might have been expected ; for example, in ten years the goods sent *into* India have increased from about 1 to 6, while the rugs and carpets sent *out* have increased from 1 to about 2 or rather less. But during the period 1895-1902 the increase was from 24 to 62. And if the carpets and rugs sent out to the United States be considered apart, the increase during the full period has been about ten-fold or more, while for the period 1894–1902 the increase was as 16 to 384—a truly remarkable growth. A further feature deserves notice. Whereas carpets and rugs have entered India in a steadily increasing amount, they do not now leave India as extensively as in 1901-02. The falling off is due to lessened traffic with the United States, for in the first year under consideration for 16 pounds sent to the States alone 225 went elsewhere ; in 1901-02 for 384 to the States alone 244 went elsewhere ; but during 1905-06 the ratios were as 179 to 254. Hence it may be taken that about the year 1901-02 there was a large boom in Indian carpets principally for the American trade. Exclude that trade, and what remains has developed from 225 to 254 since 1894 at a steady rate.

The Persian carpet trade through Bombay is roughly indicated by the bracketted figures in Statement A. It will be noted that more carpets now enter Bombay from Germany than from Persia. Most of the carpet factories of modern Persia have no dealings through Bombay. The figures only indicate that cheap German carpets sell more readily in India than Persian carpets, and means little more than affirming that the proportion of people able to spend one anna to those affording ten annas at least equals ten to one.

No figures indicating to what extent the trade in cheap carpets from Agra and Cawnpore has developed have been obtained, hence it is difficult to compute exactly how powerful is the competition which meets the small carpet-maker of Gujarat or the Deccan. He is pulled in one direction by Bombay and its imports, while Agra and Northern India pull him quite as forcibly northwards. Between the two his chances of success are small. The next chapter on Raw Materials will show how he is further handicapped.

CHAPTER III.

Raw Materials.

The term ' raw materials ' as applied to carpet-making calls for explanation. The raw material used by the peasant weaver of Ratodero is raw indeed ; but who can describe as raw the material used say at the Nagar factories where the wool is received already spun by machinery and also dyed ? There is little left in such a factory in the way of truly raw material. The greater the organization the less raw is the material. This is the general rule of all modern manufactures, and the carpet-making factories of this Presidency have followed suit.

The materials used in carpet-making fall under four heads, whether the fabric be a pile carpet or a *dari*. They are : (*a*) material for the foundation of the fabric or the warp ; (*b*) that for the woven portion or the weft ; (*c*) the materials used in the dyeing ; and (*d*) such accessories as looms, tools, rods, poles and miscellanea.

(*a*) For the foundation or warp. Practically all carpets nowadays are made with a cotton warp in the manner described in the next chapter. Formerly wool was used ; for carpets made in India this is now quite unusual. The writer is unaware whether silk is used for the warp in silk carpets, which fabrics practically do not fall within the scope of this work, as they are rarely made, and there is no likelihood in the least of an industry in silk carpets ever arising. Jute and hemp enter into the warp of coarse grades of carpet, often as an adulteration. Hence for the foundation the two materials used to any appreciable extent are cotton and wool, the latter only when specially ordered. (*b*) The woven part of the carpet or weft in *daris* is generally cotton, though it may also be hair or wool or even silk. In pile carpets the true weft, explained in the next chapter, is generally of cotton, the actual pile being of wool. But either of these parts may be cotton or woollen. The pile may at times be of hair. Hence the raw materials for the woven portion are cotton, wool, or hair. (*c*) Although dyeing is treated in a separate chapter, it will be convenient to consider in this place the raw materials used in connection with it.

A very brief survey is now presented of the facilities which the carpet manufacturer has for getting raw materials.

Northern Division.—Although cotton is grown widely throughout this division little of it remains near its source of origin for the small weaver. Wool can be had, but only of inferior quality. Dye materials can still be had, though less cheaply than formerly. For example, at Ahmedabad, wool and indigo in small quantities with *dodam* husk are the only raw materials locally produced, except that *manjit* and *kismaj* are still grown to a very small extent. Wool in Broach (Amod) costs a rupee for five seers ; at Surat it costs Re. 1-10

for five seers. Two years ago the Surat rate was Rs. 1-2. Cotton throughout the division varies as follows: at Vagra in Broach a *kutcha* maund costs Rs. 10; at Anand in Kaira a local maund costs Rs. 16. The indigo growers of Jambusar have started cotton-growing in the place of indigo.

Central Division.—Cotton is reported on as follows:—Nagar cotton ginned and baled for Bombay costs Rs. 23 for a *pulla* of 120 seers or about ten pounds a rupee. Chalisgaon cotton costs Rs. 100 per *kandi*. Erandol cotton costs about 7 annas a seer, while thread at the Jalgaon mills can be had for 12–13 annas. The Jamner *jhoryas* are made from refuse cotton selling at 3 to 4 annas a seer. Ravar cotton fluctuates between Rs. 5-8 and Rs. 8 per maund. Sindkheda cotton costs only Rs. 5-8 per *kandi*. Cotton thread locally spun at Yaval sells in the bazar at 3 to 4 annas a seer less than the imported supplies. The Gokak Mills supply thread made from cotton brought in from the Madras Presidency and the Nizam's Territory. The Sholapur mills supply thread at Rs. 3-14 for ten pounds.

No wool is produced in this division except around Sangola in Sholapur. The entire supply is used for blanket-making.

The reports concerning dyeing materials furnish melancholy reading. At Nagar and Bhingar indigo dyeing on a small scale is still practised though not with locally-grown indigo. *Kasumba* was formerly grown at Shevgaon. The earlier very considerable cultivation of indigo, *al*, and certain other dye plants has now ceased at Amalner. Although Bhusawal has good soil for *guli* and *al*, these plants are no longer grown there. Large well-built *kunds* around Chopda demonstrate the former existence of a busy indigo dyeing industry. *Al*, indigo, and *kasumba* were formerly much grown at Raver: now they are not cultivated. *Hirda*, *kapila*, and *dhasti* grow in the forests of the Satara Collectorate, but these plants need no care and their survival does not connote any revival of vegetable dyeing. Indigo dyeing in Sholapur has declined. *Kasumba* from Bengal and *surangi* of good quality were tried; now their cultivation has ceased.

Southern Division.—At Gokak a rupee will buy about 12 pounds of unginned and 4 pounds of ginned cotton. At Bagalkot hand-made yarn is sold in the weekly market at a rate of 7½ pounds per rupee. At Indi, cotton selling at about 12 pounds a rupee is plentiful enough, but most of it is exported.

No wool comes from the Southern Division. As to dyeing, at Bagalkot *daris*, *saris*, and silk goods are dyed, but in aniline. *Kapili* powder is still used: superior *kasumba*, termed *kushi*, and *patang* wood were formerly in use. Many other unimportant vegetable dyes have also disappeared. Now the practice is to 'top' vegetable dyes with aniline. In the Ratnagiri District many dyeing agents of secondary importance still grow rather from inherent hardiness than from cultivation. Most of them are of use rather by reason of their astringent properties than on account of direct tinctorial powers.

Sind.—Nowadays Sind can be said to be better off than any of the rest of the Bombay Presidency in raw materials, for it possesses cotton as good as any elsewhere, at least for *dari*-making. Its wool though not good is at least better

than that of Gujarat, while it still possesses in lac a dyeing agent which has quite successfully resisted aniline. And many of its outlying parts are so far removed from frequent communication as to keep away the commercial agents of the cheap Agra and Cawnpore-made carpets. Each Collectorate and the two Deputy Commissionerships will be taken in order.

Karachi.—Ghorabari wool fluctuates from Rs. 10 to 20 per maund and is apt to contain an astounding amount of sand by way of adulteration. Most of this wool goes to Karachi City. At Mirpur Batoro wool costs 8 annas a pound. Cotton yarn there costs 4 annas. All the dyeing in Karachi is in aniline.

Hyderabad (Sind).—Wool at Hala costs 8 annas a pound. The cotton used is locally spun, and often the carpet-weavers own cotton fields. Dyeing is practised solely for carpets. Lac is very plentiful in the numerous forests, but most of it is exported. At Guni a pound of wool costs 5 annas 4 pies: cotton thread costs between 6 and 7 annas; camel or goat hair 2 annas a pound. In the town of Hyderabad to dye one *dari* with aniline costs 4 or 5 annas, while prior to the fabulously high price of lac the same would have been lac-dyed for 2 annas. At Kandiaro in a ten-rupee carpet the wool costs five rupees, the lac takes one rupee, and alum, chunam, and other miscellaneous articles take another rupee—thus seven rupees in all are absorbed. Vegetable dyes are still used at Kandiaro. At Naushahro wool costs 4 annas a pound, indigo 1 rupee, lac 6 rupees, while cotton costs 2½ annas. Generally, a carpet contains 6 seers of wool costing Rs. 3, while the dye in it costs another rupee. The labour varies from Rs. 4-8 to 7-8. Such a carpet would measure 4½ by 7 feet, and as a general price would cost Rs. 10. At Sakrand, *unna* or sheep-wool, *dasa* or goat-hair, and *mitsa* or camel-hair are the chief raw materials. All are produced locally, but the first two generally come from Kohistan. If locally produced, wool costs about 5 annas a pound, goat-hair 2 annas, and camel-hair 3 annas. From Kohistan wool arrives costing per pound 2 annas 8 pies and goat-hair at about 1 anna 8 pies. *Manjit* and lac are no longer used at Sakrand. At Tando Allayhar goat-hair costs nearly 5 annas a pound; the same price is asked for camel-hair.

Sukkur.—At Shikarpur locally-grown wool costs a trifle over 3 annas a pound; imported wool costs 4 annas.

Larkhana.—Wool, goat and camel hair, lac and indigo are produced. At Ratodero lambs' fleeces sell at under 3 annas a pound, while aniline has not been introduced. *Kesugul*, lac, *khabar*, *mawa*, *manjit*, and *hed* are among the local dye products. Of all the parts investigated Ratodero has advanced the least from primitive methods. At Sehwan, where wool has much increased in price of late, the article now costs 8 annas a pound; cotton thread costs 6½ annas.

Upper Sind Frontier.—The only lac now procurable comes (at least at Thul) from the *banias'* shops. At Jacobabad the little dyeing done is for carpets only. The local prices are: wool 3½ annas, cotton 4¼ annas, lac 12 annas, indigo 14 annas, *manjit* 8 annas, and a local dyeing agent of unascertained name 3 annas per pound.

Thar and Parkar.—All the Pithoro lac is exported. Sanghar produces a little wool.

General Summary.—Thus in general terms it may be said that Gujarat does produce wool, but it is of poor quality, while the cotton produced is not attracted by the very small industry in carpets which exists. In the Central Division no wool is grown, while the cotton is all exported, save only the very inferior, which is good enough for the coarse *jhorya.* As to the dye plants, their neglect may be considered almost complete. The Southern Division is for the most part unsuited by nature for the production of the raw materials under consideration. Sind does produce wool which, while better than that of Gujarat, is for the most part very poor and not to be compared with that of Rajputana and still less with wool from the hills to the north of India.

It is with regard to raw materials that any attempt to establish a factory anywhere in the Bombay Presidency which shall successfully compete with Amritsar or Mirzapur is from the outset severely handicapped. At the very most all that a purely commercial factory can hope to do is to take its share and no more in the general trade in carpets of only moderate quality and of decidedly moderate price. Large firms alone can afford to make high-grade carpets, and it is very doubtful whether any purely commercial factory in the Bombay Presidency could become large enough to be able to withstand the lean years which would certainly be encountered.

CHAPTER IV.

Construction.

PART I.—CARPET MAKING IN GENERAL, WITH SPECIAL REFERENCE TO DARIS.

Carpets in India are always made by hand on looms of two descriptions—the horizontal and the upright. As a rule the former looms are reserved for *daris*, generally made of cotton; the latter for *galichas* or pile carpets, for the most part made of wool. Whereas no pile carpet is made on a horizontal loom, at times *daris* are made on vertical looms.

With regard to horizontal looms there is no clear line of demarcation between a simple *dari* of transverse stripes and a blanket or piece of thick cloth. As regards mechanism the two are made on the same principle, only the working parts vary in strength and solidity. When a *dari* of over five feet in width is to be made, so inconvenient is it to throw a shuttle from side to side that another plan has to be adopted. As Mr. Brendon covers the ground in his monograph, looms adapted with shuttles for narrow *daris* will not be included in this account.

Every carpet, *dari* or *galicha*, consists of two series of threads—one set running from the observer's feet ahead, the other set running laterally. These threads constitute the 'warp' and the 'weft' respectively. For all forms of cloth-weaving these terms hold good. In a *dari*, the weft threads are so applied that a design is formed; with a *galicha* or pile carpet this is brought about by the entwining of coloured loops of wool around the warp threads, the weft threads being applied from time to time during the process as described later. By such a device the free ends of the loops conjointly form the pile of the carpet, while the weft threads in this case are known as the *poth*. The frame on which the warp threads are stretched is the 'loom': the entire set of warp threads stretched and ready for further work is called the *than*, or by some the 'warp': the arrangement for reversing or tightening the warp threads is called the 'ratch.' These terms—warp, weft, *poth*, *than*, loom, and ratch—are applied to the main parts of the mechanism on which every carpet is made. They will now be described in further detail in connection with *daris* and *galichas*.

In a *dari* the materials commonly used are two only, namely, undyed cotton and dyed cotton. The former is used in the warp, the latter in the weft. For the sake of clear distinction, the former will be referred to as *thread*, the latter as *yarn*.

Preparation of Warp Threads in Dari-making.—The warp threads are prepared as follows. The Bombay mills send all over the Presidency bundles of cotton yarn, or twist as it is often called. Such bundles weigh ten pounds each and contain twenty twisted skeins of cotton of one half pound each. Each skein is

opened out by a peculiar process of elbowing it straight—one of the many little tricks which only the actual worker accomplishes readily. Having straightened out the skein he loosely separates the layers of cotton fibres into strata, and such an opened-out skein he places on a light wooden frame or *chheriki*. Such *chherikis* are illustrated in Mr. Samman's 'Cotton Fabrics of Assam.' Plate I, Fig. 2, of that work well shows the mechanism. The worker, if a novice, arranges two *chherikis* alone in front of himself; if skilled, he loads up three, four, or even more such *chherikis*, which he fixes in the ground ahead of him. He then takes in his right hand a light frame somewhat like a *chheriki*, termed a *lathai*, and from each *chheriki* he takes one cotton fibre. The fibres he twists up into a thread which he loosely applies to the *lathai* with his right hand. Then by a rotary movement of the right wrist he turns the *lathai* round in a circular fashion, thereby unwinding the fibres from the *chherikis*, loading up the *lathai* the while. It should be carefully borne in mind that what happens to the fibres which become wrapped round the *lathai* is that, if two *chherikis* are used, two cotton fibres come to lie in juxta-position; if three *chherikis* are used, then three are thus placed, and so on: what does not occur is any twisting of these threads around each other; they remain side by side and no more. Hence it is clear that from two, three, four skeins of twist, strands of cotton of two, three, four fibres each can be obtained, and by repeating the process, five, six, seven fibred strands and so on are made: the more skilled the labourer the fewer being the times he has to repeat the process. This process is termed 'the opening up of the twist' and is the first process in the preparation of the warp. It is also the first process in the preparation of the weft, the later stages of which are described hereafter. The opened-up twist is then taken to a *rahat*, or country spinning wheel, which is a mechanism too frequently seen to need separate description or illustration. Plate II, Fig. *b*, in Mr. Brendon's 'Woollen Fabrics,' is a good representation. By means of this machine the juxta-posed fibres are twisted up into a cord or true thread. The number of *tars* or fibres thus twisted up into a cord varies and is of no concern at this moment.

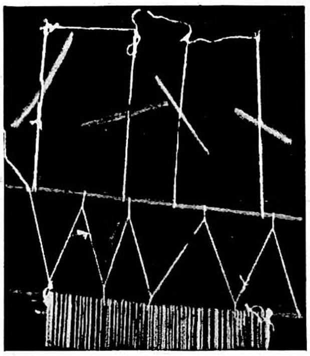
The above account refers to the simplest mechanisms. To save labour a simple system of pulleys, piping, and a revolving wheel enables the *lathais* to be mechanically rotated along with twenty or thirty others as required. In the same way a spinning frame can be easily erected whereby all the spindles are rotated by the passing of a continuous rope. This latter mechanism by no means gives the excellent results of separate *rahats*: for 'opening up the twist' the combined method works quite well. At Yeraoda the twist is opened by such a mechanism on to revolving cones termed *asaris*, but the writer has never found these any advantage over the much less expensive device erected at Hyderabad (Sind). The second stage therefore is the 'twisting of the threads.' The *rahat* or spinning wheel twists the threads on to small tubes of bamboo or tin (generally strips of the ubiquitous kerosine oil tin), and from these the threads are wound up into balls either by hand or by a balling machine. The latter does its work far more rapidly and also far more uniformly than the hand method; however in a jail there are always many convicts either physically unfit for harder labour than ball-winding involves, or else

having other duties, such as opening and closing a gate, the intervals in such a duty being devoted to winding balls by hand. Hence stage three consists in 'winding the threads into balls.'

Description of Dari Loom.—Here a digression is necessary, for now the loom comes into use. A *dari* or horizontal loom will be first described. It consists merely of two stout beams of wood, at least wide enough to slightly exceed the width of the *dari* to be made. In length it generally exceeds by about three feet the full length of the *dari*, though it may be twice as long, so that two *daris* can be made at the same time from it. The beams are placed parallel to each other, and raised above the ground to the extent of about six inches. Beyond these beams there are certain pegs driven into the ground to secure ropes whereby the warp threads in a way about to be described can be drawn perfectly taut. Plate I, Fig. 1, shows this in a more or less diagrammatic manner. Many of the illustrations were modified for the purposes of better demonstration, as in this case, in which a miniature warp was erected on a board. To save space and cost one end only is shown in the figure. In the illustration referred to, miniature rods to represent the beams are shown, and at one end are lashings to keep the beam steady, while at the other end the lashings have sticks, known as *wakr* or *amra*, inserted in the loops so that, after the manner of a Spanish windlass, the whole can be drawn tight. The device is extremely simple and effective. Plate I, Fig. 2, shows very well what actually occurs, and should be referred to in the description which now follows. Having fixed the loom, the 'spreading of the warp' follows. Taking a ball of thread in his zinc saucer (a most convenient vehicle for the work), the worker loosely ties a free end round one of the beams at the extreme left or right, and walking to the other beam passes the ball under the beam and replaces it in his saucer. Arriving at the first beam he passes the ball under and then over the beam, back into the saucer again, then under, round, and over the far beam, and so on. In practice three men are engaged in this work: one at each end to pass the ball under or over as needed, one travelling to and fro. While the latter is between the beams, the others are seeing that each thread is properly taut and that its distance from the neighbouring threads is correct. Obviously the whole of the two beams become encircled in a series of very long figures of 8, there being an intervening intersection. Provided the ball of thread is large enough, it is possible to spread the complete warp of a *dari* without a single knot other than that at each end. At the extreme edge on each side a separate figure of 8 is stretched with thread thickened to the dimensions of strong cord. This is to resist side-strain. The fourth stage therefore, assuming a loom has already been provided, is the 'spreading of the warp.' Although easily comprehended, its practice is difficult, as only working experience enables one to draw the threads uniformly and properly taut.

Formation of the Dari Loom Ratch.—The next process is the formation of the ratch—an appliance not at all easily comprehended and still more difficult to describe. Plate I, Fig. 2, is a very good illustration. In this figure the ratch is the transverse erection which supports a series of dependent loops, the healds, each of which encircles one of the warp threads. This series

PLATE I.



..........*wahr* or *amra*.

Fig. 1.

Showing the method of tightening the warp threads in a *dari* loom. The work is commenced from the other end, not shown in the figure.

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Fig. 2.

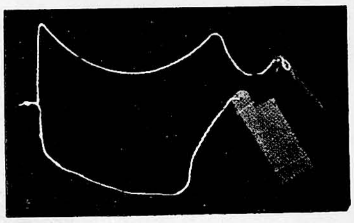
A scene in a jail *dari* factory—Weaving a cotton *dari*. The ratch consists of the transverse beam from which is suspended a pair of light bamboo rods: from each of these depends a *seri* of loops—the two rows of healds. The use of the ratch in *dari* weaving is explained on pages 35 and 36.

PLATE II.

Threading the 'sewi' and 'parti' preparatory to making healds in 'Dari' weaving.

Fig. 1.

The *sewi* and *parti* referred to in para (*a*), page 31. As seen after the stages shown below.



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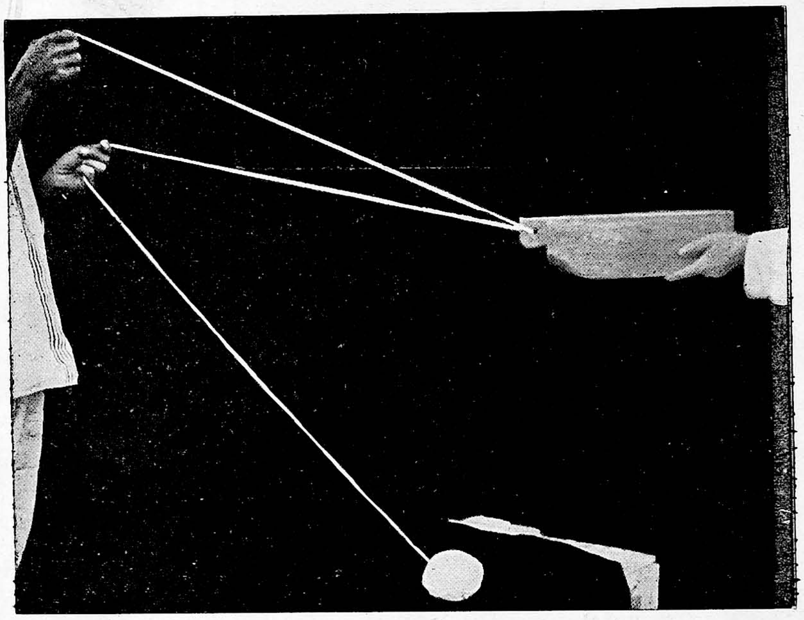

Fig. 2.

The stretched cords must each exceed the width of the *dari.*

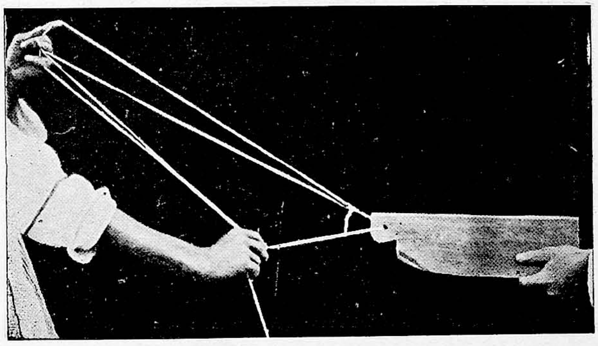

Fig. 3.

The upper hand is approaching its owner; the lower hand is approaching the wooden *parti.* The knot has just passed through the hole.

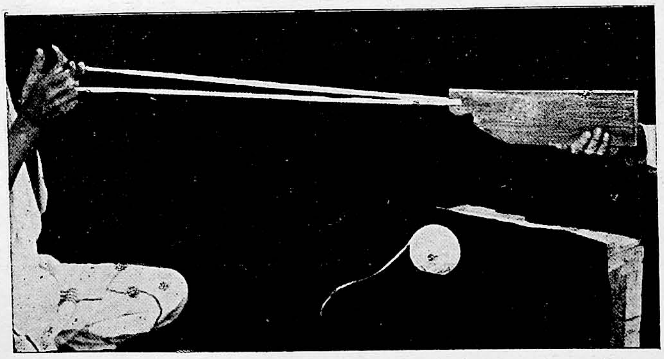

Fig. 4.

The ball of thread has been detached. The loops are now pulled taut.

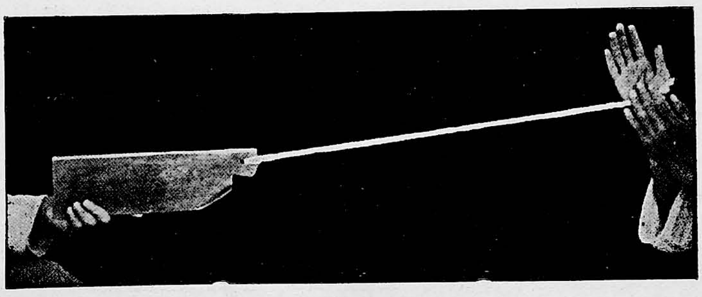

Fig. 5.

They are then rolled into a single piece of string.

of threads is composed of two halves—one half being loops which, encircling, say, the lower warp threads, ascend to the bamboo comparatively near the weavers ; the other half being loops engaging the upper warp threads and passing to the bamboo farther away from the workers than the bamboo just mentioned. These bamboos are attached by ropes to short curved pieces of wood called *makra* or *dhum* which work over the transverse beam so conspicuously seen in the illustration, very much after the manner of a violoncello bow. Such is the ratch in general terms, and as it is an essential part of the mechanism, its details should be studied. A considerable digression is now unavoidable.

Formation of Healds in Dari-weaving.—Having spread the warp threads, two spaces are found to exist between the upper and lower layers as two elongated triangles with the beams as their bases. These are referred to under the name of *ched*, that is 'hole.' Into each *ched* a thin bamboo stick, such as is used for punkah-pulling, is inserted, and by attempting to approximate these sticks the 'intersection' is of course the more clearly defined. At the same time by using the sticks after the manner of a sight-line any broken or slack or incorrectly placed thread is at once detected and rectified in time. The vernacular term for the intersection is *joki.*

(*a*) A piece of wood shaped as in Plate II, Fig. 1, of hard material, and for preference well polished, is taken. Seen on end, its upper part or back is thick and rounded, the lower edge is keel-like, though also slightly rounded. This is called the *parti.* Through it at one end a large hole is bored capable of taking a cord of fair dimensions.

Again, another piece of wood shaped exactly like a large roughly-made needle, and furnished, like a needle, with a hole, is taken. The *parti* is about seven inches long, the *sewi* or needle being about an inch longer.

(*b*) The manner in which the *sewi* and *parti* are threaded is a simple and an interesting process. As the same method is adopted for each, the threading of the *parti* will alone be described. A ball of thread being taken, one of the ends is passed through the hole and carried on till the two pieces held up by the worker's hands as shown in Plate II, Fig. 2, well exceed the width of the *dari* under manufacture. They are then knotted as shown in Fig. 3, in which the knot appears near the hole through which it has just passed. The man manipulating the threads is continuously passing his right arm away from his body while his left arm moves in the reverse direction. This pulls more and more thread through the hole and more and more loops are taken up by the left hand. Two loops are shown in Fig. 3. The work will go on till some five or six loops are made. Then, as seen in the next Fig. 4, the ball of thread is detached and the loops well pulled out. Then by a movement of the hands, very well shown in the next Fig. 5, the loops are twisted up into a cord free from knots. This process is the 'threading of the *parti*,' and the 'threading of the *sewi*' proceeds in a similar manner. Then the thread attached to the *sewi* is knotted up to that of the *parti*, solely to guarantee that the ends do not go astray in subsequent manipulations. (Plate II, Fig. 1.)

(*c*) The subsequent manipulations are not easily followed, but by the help of the plates the reader will possibly be able to follow the ingenious devices about to be described. All the figures in this description are on Plates III and IV. The 'intersection' having been well defined by the two cross-bamboos as mentioned above, the remote rod is replaced by one of stouter dimensions while the proximal rod is pulled out. The stout rod is then pulled near the worker, thereby widening the *ched* and bringing the intersection near the operator. This is seen in Plate III, Fig. 1. The worker standing at the left edge of the loom (in these figures mounted on a table for photographic conveniences only) holds up the *sewi* and *parti* in his left hand. Close inspection of Fig. 1 shows the following: (*a*) the *sewi* above the *parti*, each with its cord attached at the end nearer the onlooker; (*b*) the intersection or *joki;* (*c*) two threads passing from two balls of thread beyond the photograph and away from the onlooker (each of these threads passes through a *ched*, and of them that nearer the worker clearly passes on to the tip of the *sewi* which is loosely embraced by it). The end of the other thread is at this stage free.

The next Fig. 2 shows as follows: (*a*) the thread formerly at the tip of the *sewi* has been passed along to the end near the onlooker; (*b*) the thread from the nearer ball of string, in this case shown in the photograph, has been picked up in the form of a loop as it passes from the first figure of 8 of the warp to the next figure of 8; (*c*) incidentally there is seen how the cord at the very edge is thicker than the others.

The next Fig. 3 is important. The worker has passed his right hand forwards to the right and slightly upwards, thereby inducing the thread he holds taut to slip in between the *sewi* and the back-edge of the *parti*. Thus the *sewi* projects through the upper loop of the figure of 8 about to be formed. The portion of string grasped by the right hand is allowed to fall, after the loop round the *sewi* has been effected. Then the worker dips his fingers between the two next threads of the warp but on the side hidden by the *parti* from the onlooker. He again picks up the transverse thread running through the proximal *ched* and repeats with it the process described above. By dragging on the thread the figure of 8 previously formed is automatically drawn tight. And so he goes on.

Plate IV, Fig. 4, shows the making of the next loop, while Fig. 5 shows how two have been made and the third is being done. In this latter figure the worker is holding up the thread to show its continuity with the transverse cord. In practice he would not do so.

While all this is going on, the *sewi* and *parti* are being gradually advanced from left to right, these two pieces of wood thereby travelling through two tunnels of looped strings, one above the other. As each piece of wood gets clear of the loops, the cords with which they are provided follow on in the rear.

Fig. 6, in which the loops formed have been darkened while an attempt was made to whiten the *parti* and *sewi*, shows excellently (*a*) the upper and smaller loops, (*b*) the lower elongated loops, (*c*) a thread passing through each, (*d*) the

PLATE III.

Making Healds in 'Dari' weaving.

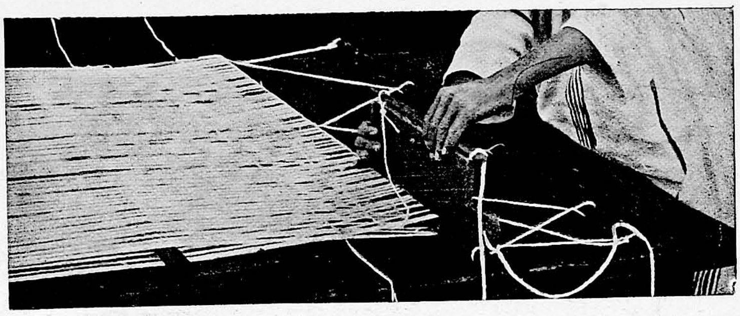

Fig. 1.

Note the *sewi* above the *parti*, each with its cord attached. Note also how a thread traverses each *ched*. Note also the *joki* or 'intersection.'

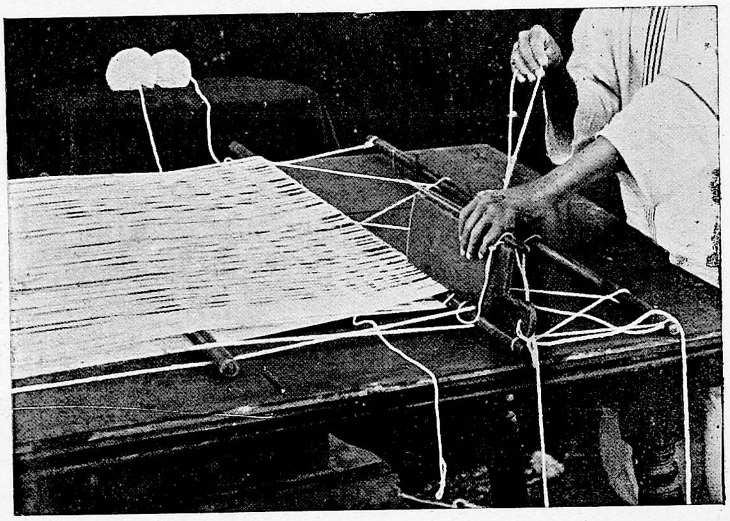

Fig. 2.

The thread formerly at the tip of the *sewi* is now at the other end. The first loop being made.

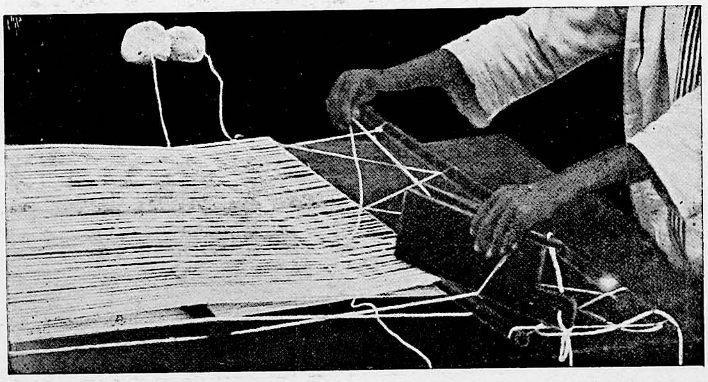

Fig. 3.

The first loop is almost completed

PLATE IV.

Making Healds in 'Dari' weaving.

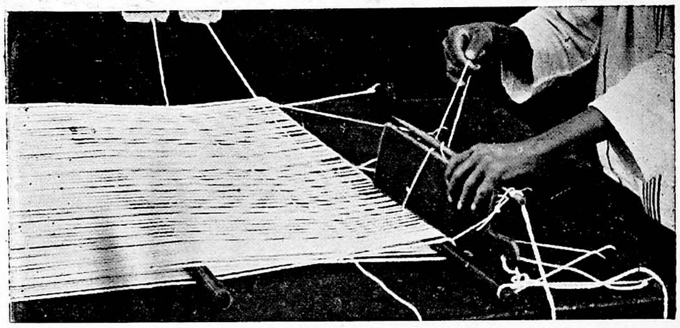

Fig. 4.

The second loop is being made.

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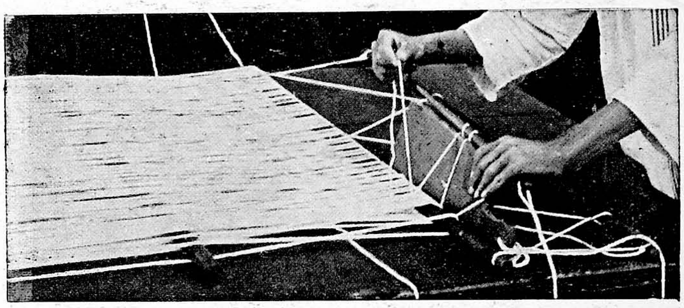

Fig. 5.

The third loop is now being formed.

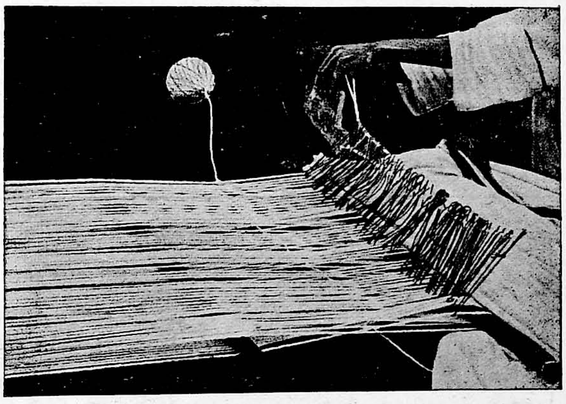

Fig. 6.

Showing how the threads from the *sewi* and *parti* are holding up the loops.

[Explanation on page 32, last three paragraphs.]

sewi and *parti* at the end of their task. A bamboo rod is then passed through the lower loops, whereupon the *parti* and attached cord are disengaged and withdrawn. The *sewi* is severed from its cord close to the eyelet, but the cord remains *in situ* for further procedure. Often the smaller upper loops are by a double turn re-duplicated.

The above somewhat lengthy account applies only to the cord passing through the *ched* near the worker. A precisely similar procedure is then carried out with reference to the other cord traversing the distal *ched*. In this case too a bamboo rod is threaded along the lower tunnel of long loops. But there is an essential difference in this respect. The *joki* has the effect of rendering warp threads which are uppermost on the proximal side of the *joki*, lowermost on the distal side. Consequently, whereas the first set of loops picks up the upper warp threads, the distal set of loops, though still picking up uppermost warp threads, avoids all those engaged by the first set of loops. Hence between them the two sets of loops engages all the warp threads.

Each set of tunnels will therefore have a rod running along the lower part, and a cord, formerly attached to the *sewi*, along each upper part. The cords are in each case drawn taut and then secured to the extremities of the rods. Then by rope each rod is suspended to the curved stick referred to previously and well shown in Plate I, Fig. 2. Obviously, if one of these sticks is pulled by the worker towards him the transverse bamboo rod near him drops and the threads which the loops embrace tend to fall or at least are slackened. Simultaneously the lower warp threads tend to rise owing to the raising up of the other end of the stick.

These curved sticks or *dhums* are mounted over a stout transverse rod which rests by its ends on *kutcha* supports. This support is called the *ghora*; the transverse beam is the *dhum-ki-lakhri*; the bamboo rod running through the loops is the *ratch-ki-lakhri*; the cord along the upper surface of the latter is termed the *ratch-ki-dhori*.

Thus are prepared the loom, the warp threads, and the ratch for *dari*-making. The preparation of the *galicha* loom is a very different matter; its description is deferred till *dari*-making has been disposed of.

Tools in Dari-making.—The only tool of any importance used by the *dari*-maker is the *kanga* or fork, an instrument consisting of a wooden handle about six inches long, into the broadened end of which about eight stout steel blades are evenly inserted. Each blade is shaped after the manner of a penknife blade with the tips all level and the curves filed flush. The edges however are not sharp. The instrument should be well balanced, so that when held in the hand after the manner of a dagger about to be struck downwards the worker is easily able to give to the pronged end short, light, downward strokes familiar to all who play that form of instrument known to nigger minstrel troupes as 'the bones.'

Preparation of Yarn for Dari-making.—The 'opening of the twist' has already been described. In preparing the yarn as contrasted with the

thread for a cotton carpet of the *dari* type, the process called 'the twisting of the thread' is not followed. After five or six fibres have been placed loosely side by side in the opening process, the fibres thus prepared are taken to the dye-shed where processes go on which need not be considered now. On returning from the dye-shed the fibres will of necessity have been much dishevelled, especially if the dyeing processes have been tedious. It will therefore be necessary to once more open up the twist—in this case it will be an 'opening of dyed twist or yarn.' When this is over it is wound up into little loops just long enough to be reached by the thumb and little finger of an expanded hand. In this compact form it is most conveniently handled by those who have to do the actual weaving.

Condition of Loom at the commencement of Dari-weaving.—Let it be assumed that the weaving is about to commence. This means that the entire *than* has been scanned for broken or slack threads; that the beams at the end have been properly adjusted; that each of the two sets of healds has no broken or faulty loops but that all are of equal depth and embrace the proper threads. It pre-supposes too that the transverse beam and the entire ratch have been drawn forwards towards the worker to such an extent that by actuating the wooden bows just the requisite amount of movement is conveyed to the warp threads. If the *dari* is to be two feet wide only (a very narrow *dari*), one worker will squat so as to overhang the beam which is remote from the system of *wakr* or Spanish windlasses previously referred to. If the *dari* be wider, a weaver for every two feet is customary. The small bundles of coloured yarn are conveniently suspended, till wanted, from the transverse beam of the ratch. The observer will understand that if the curved sticks be in any position other than midway between up and down, there will exist a gap or *ched* between the upper and lower warp threads. This in section will have the form of an elongated triangle with the tip towards the squatting weaver.

Initial Steps in Weaving.—Across this *ched* he passes a stoutish cord which he lashes at each end to the adjacent beam. Then he reverses the warp threads and again passes a cord. These cords are driven home with the *kanga* as near to the beam as possible. These, the *dhori* and *chiri* respectively, are inserted in some form or other in every kind of carpet, and in *dari*-making the two make a kind of bulwark against which the worker may continue to beat, well aware that he runs no risk of driving the weft threads too far. The *dhori* and *chiri* then, commence the end at which work starts. They are not however an integral part of the *dari*, as will be seen later. In nearly every *dari* the first inch or so is generally undyed, and then follows an inch or so of plain red or plain blue or so on. Sometimes a third strip of plain colour exists. Each of these strips is termed a *patti* or band as each traverses the full width of the *dari*. They are woven in as an integral part of the *dari*.

The 'weaving in of the *patti*' is effected thus. Taking, say, a bundle of white yarn the worker passes it across the *ched*, unwinding the bundle as needed till the yarn traverses the whole. At one edge will be a free inch or so

of yarn; at the other the balance of the bundle of yarn. If the *dari* is a wide one, the yarn is passed along from hand to hand. Then the forks beat the yarn well home, whereupon the entire ratch is reversed and the bundle of yarn once more traverses the *ched*, though this time in an opposite direction. This process is repeated some eight or nine times according to the width of the *patti* or the fineness of the yarn. It constitutes *dari*-weaving in its simplest form, and for it *per se* a shuttle could be used which could be thrown across mechanically. The reader is asked to note that in this process the ratch, which in a wide *dari* may have as many as ten curved pieces of wood or *makra*, is throughout its full width wholly reversed after each passage of the yarn. This does *not* occur when the weaving of most forms of designed figures is in progress. To a modified extent it does occur when certain regular geometrical figures are being woven.

Let it be assumed that after the *patti* stage has been reached a chess-board style of pattern is to be woven in black and red. If each transverse row of squares as the work advances be lettered A, B, C, D, etc., while a square at the edge is 1 and that to its right 2 and the next to the right 3, it will be easy to follow what occurs.

The worker knowing that each square is to be, say, eight warp threads wide (a piece of knowledge gained by counting the threads in the pattern or design), picks up with his fingers four warp threads, and holding these well up with the left hand he inserts below them a strand of red yarn. Then going to square 3 he does the same thing with a separate bundle of red yarn. And then he does the same at square 5. Or if he has fellow-workers, they are doing the same at Nos. 7, 9, etc.. Then all turn their attention to the black squares Nos. 2, 4, 6, etc. After that all reverse the ratch after having beaten home the yarn with the *kangas*. The process is repeated till the requisite number of threads of yarn have been woven in. In this case too, at least theoretically, the workers weave in such unison that all are ready at the same time, and without delaying work, to have the ratch reversed. In practice such does not often occur, for workers weave at far from uniform speed. Hence each must be able to work his portion of ratch apart from his neighbours. As a matter of fact the actual change effected by the ratch and the use to which it is put in practice is not at all a mere raising and lowering of threads.

Use of the Ratch in Dari-weaving.—So long as the weaver has to deal with parallel lines, that is to say, lines parallel to the ends or sides of the *dari*, no great difficulty is met with; only when the lines become diagonals or curves, a different problem is presented. The way in which the ratch is made use of in actual practice is as follows. The weaver has passed, say, red yarn under five of the upper warp threads; he now wants to pass red yarn on the under side of the lower warp threads: how will he do it? The simplest plan will be to reverse the ratch, though by so doing he will almost certainly inconvenience his neighbours, or perhaps the very next piece of weaving that awaits himself is to pass certain colours to the immediate right or left for which he would once again have to reverse the ratch. Hence the mere reversal of ratch will not do,

for he would be constantly altering it and wearing out the threads. Therefore to get under the lower threads, he passes his left hand fingers *below* the *lower* threads, slips the hand thus employed up along as far as the corresponding loops, and to these he gives a short upward pull towards his own body. This momentarily raises the warp threads above the general level, and underneath them with the other hand he rapidly inserts coloured yarn. So conspicuous is this pulling up of the warp threads, and so rapidly is the coloured yarn passed underneath, that the latter process, to which the former is really subordinate, is apt to be overlooked by the casual observer. The real use of the ratch is to keep the threads tight and not to reverse the warp. There is for every stage of the work a proper distance intervening between the ratch and the line of work, and the shorter this distance the greater will be the tightening power of the *dhums*. Hence each worker has in his charge so many warp threads, and for these he has his own *dhum* which he actuates independently of his neighbours. It is only when transverse stripes free from any figuring are being done that the entire set of *dhums* is reversed at the same moment. Having inserted the yarn, the warp threads is released from the fingers, and the upper and lower sets of warp threads resume their former positions, a few sweeps with the back of the hand across the threads accelerating this resumption of place. Then the *kanga* is used to drive the weft well home, and so the work proceeds.

Progress of work in a simple Dari.—How does the worker know whether he is proceeding aright or not? The answer to this question is that either he has near at hand a sample from which he counts so many threads whereby he knows how many threads he should use in the work in hand, or else he has by practice learned all the essential parts. This is by no means so difficult as might be imagined, for most *daris* have a simple geometrical configuration, and having started the first inch or so correctly, the mere identification of the leading warp threads is all that is needed for a correct result.

Procedure in more difficult cases.—When complicated designs have to be worked out a weaver of totally superior resources is needed. To keep correctly to the figure by a mere counting of threads would be difficult and tedious. In such cases good work is the more likely if all the main figures in the design are first of all chalked out in red or other colour over the entire surface of the warp. To facilitate this, and indeed for all kinds of carpet-work, it is customary to mark on the warp threads with lamp-black clear straight lines running at right angles to the line on work. If these lines be drawn by releasing with accuracy a blackened taut cord on to the *than* (a common way of marking straight lines in many crafts), they with the warp threads can be used as guiding lines when the mapping out of the main figures is to be done, much as the average school-boy uses his lines of latitude and longitude for guides in map-drawing rather than for any more recondite purpose. Any attempt to describe in detail the exact manner in which the leading figures, such as squares, rectangles, triangles, or curves, are finished off, would probably lead to confusion only. A visit to a factory is needed for such information. In general, it can be said that when any mass of colour has

been filled in, for example a triangle in green, the green yarn is broken off very short and the tag tucked away among the weaving as neatly as possible. Moreover, the appearance on one side is identical with that underneath. In tapestry the upper part is the counterpart of the reverse. In Baluch carpets, such as are made in Sind, the end would not be broken off, but the bundle of yarn would be continued underneath unbroken to a part where such yarn had to appear on the surface. Hence in these *daris* an approach to tapestry is seen and the two sides are not identical.

In order to keep the surface flat and to avoid cockling a bent piece of flat bamboo with a nail at each end and termed a *panak* is fastened at each edge of the *dari* just near the line of work. The tendency the bamboo has to straighten keeps the *dari* taut laterally. The coloured yarn at the extreme edge is interwoven in the thick cord previously referred to as existing at each edge to withstand side-strain.

Finishing-off in Dari-weaving.—When the weaving is about to finish, *pattis* are inserted at the finishing end generally to correspond with those at the beginning, but the *dhori* and *chiri*, or two thick cords used as bulwarks, are not needed. To take the *dari* off the loom, the beams of the loom are slightly approximated, and with a pair of scissors the warp threads are cut along the narrow space existing between the *dhori* and *chiri*, while at the other end the cut is made just near the beam of the loom. Then workers plait up the loose ends of the warp threads into plaits of five threads each. These plaits tell certain information to anyone examining a *dari*. After plaiting, cleaning follows, whereby all tags and knots are trimmed up or removed and the *dari* is well swept. It is then ready for sale.

PART II.—GALICHA OR PILE CARPET MAKING.

Although *daris* and *galichas* are both called carpets, to most people 'carpet' means only a pile-covered woollen fabric. In construction as in other respects *daris* and *galichas* differ very much.

Opening the Twist, Spinning the Thread, Spreading the Warp.—The 'opening of the twist' and the 'spinning of the thread' in order to prepare the warp threads are identical with the processes described for *daris*. The 'spreading of the warp' is however different. Just as in *daris*, the warp threads form figures of 8 in which the beams of the loom are encircled by the loops; so in the *galicha* loom, the warp threads are in figures of 8, though in this case they encircle not the main beams of the loom but secondary bamboo rods which are lashed to the loom beams proper.

The Galicha Loom.—The *galicha* loom consists of two very stout wooden rollers supported on massive uprights, the whole being erected over a pit, preferably of masonry. The upper roller is about ten feet from the ground-level, the lower edge of the lower roller is about a foot above ground-level, while the pit is about two feet deep and as wide. The length of the rollers,

in other words, the width of the loom, varies between four and forty feet as extreme limits. The width of the loom limits the width of the carpet that can be made on it. Along each roller is a slot, and at intervals along the edges, if the roller be square in section, are holes to enable ropes to securely retain any rod or other object pressed into the slot. At the ends of the upper roller are large holes through which levers can be inserted with which the rollers are rotated even against great resistance.

The preparation of the Loom.—The preparation of the loom consists in the fixing up of the warp threads in a uniform manner and properly crossed and with the ratch affixed. In essentials, it agrees with the objects aimed at in the preparation of a *dari* loom. In this case however the warp threads are vertical; the ratch being at right angles thereto must be horizontal, while the work advances with an unrolling of the warp at intervals.

Spreading the Warp in Pile Carpets.—In the 'spreading of the warp threads,' two pegs are driven vertically into the ground, as seen in Plate V, Fig. 1, to which the reader is referred throughout this description. Going through the manipulations indicated in the figures on Plates V and VI, the workers contrive to make a series of figures of 8, the full length of which slightly exceeds that of the carpet to be made. By the various manipulations shown, they also manage to 'interlace' the figure of 8 loops along a cord which runs at the back of each rod. The reader is asked to carefully note the word 'interlace' as it well suits the effect arrived at. The loops are drawn taut, the wooden pegs, which are for temporary use only for driving into the ground, are taken out, and smooth round rods used in their place. Holding these well apart the cord at the back of each isdr awn tight and secured to the end of each rod. At the same time the 'interlacing' is well scanned and the windings so adjusted that the warp threads are evenly spaced. The object of the interlacing is obviously to prevent any lateral slipping of the warp threads when once they have been accurately spaced. One of the rods is then placed in the slot in the lower beam or roller (or, in carpets of moderate size, mere lashing with rope to the roller suffices). The other rod is then secured to the upper roller. If the carpet be only seven feet long, as is often the case, and if the distance from roller to roller be about eight feet, the intervening space is bridged over by rope strands, as is well seen in Plate VIII, Fig. 6. This figure, in common with many others, had to be 'made-up,' as insufficient sunlight entered the workshops for photograph purposes. In this case the wooden frame belongs to an ordinary weighing apparatus at Yeraoda. In many cases however the threads will hang in festoons from the upper roller. The turning of this roller soon renders the threads straight, and a little final tightening brings about the correct degree of tautness to the warp as a whole. But, thanks to uneven twisting or slight errors in the process of making the figures of 8, or to unequal stretching properties in the cotton, certain threads are sure to be looser than others, and as this is a fatal defect in a *galicha* warp, it has to be rectified. This is done by the insertion of thin flat wedges of wood under the threads requiring tightening as they encircle the upper roller. It brings

PLATE VII.

Making Healds in the manufacture of Pile Carpets.

Fig. 1.

The worker is about to pass the ball of thread across to his assistant. The ball passes *above* the horizontal bamboo rod. It also goes to the remote side of all the vertical threads.

Fig. 2.

The worker's left hand is awaiting the return of the ball, in this case handed back by the assistant *under* the bamboo rod and in the gap between the outer thread and its neighbour, that is, through the first space.

Fig. 3.

As the ball is being received, the hand extended to grasp it is encircled by a dependent loop. See Fig. I above.

PLATE VIII.

Making Healds in the manufacture of Pile Carpets.

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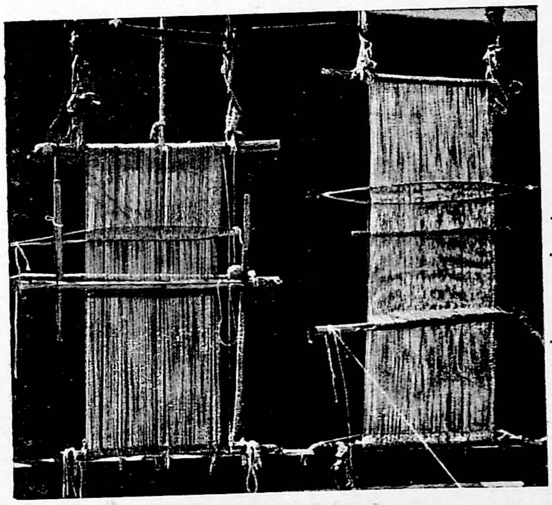
Fig. 4.

The loop referred to above is here seen accidentally caught up by the left wrist as it is being withdrawn.

Fig. 5.

A cord stretched along the front of the horizontal rod in the preceding figure should be noted. This is now pulled slightly aside and the ball of thread is passed through the space between the cord and the rod. Thereafter all the above is repeated.



..........*sikari*.
..........*dhum*.
..........ratch.

Fig. 6.

The warp on the left shows the vertical threads before any healds have been made; that on the right shows the completion of the healds.

[For further explanation see the text on page 40, lower paragraph.]

about a local tightening as contrasted with the general tightening effected by the rotation of the roller.

Fixing the Pile Carpet Ratch and Healds.—There remains for description the fixing of the ratch and healds—an ingenious proceeding very difficult to follow away from the factory. It constitutes however an essential part of the whole procedure. The reader will perhaps be better able to follow the account if the object in view is clearly demonstrated. A pile carpet is prevented from falling to pieces because it consists of a mass of short V-shaped loops, of which in each loop the tip of the V winds in and out among certain of the threads which run throughout the length of the fabric. It is this winding round the warp threads which not only prevents the pile loop from pulling out but also from slipping up and down the length of the carpet. Now these warp threads lie in two rows, a front and a back row, as looked at by the worker. If he were to insert say one pile loop, all the way from the right to the left, and beat this series down with his fork, and did no more before repeating the process, the pile would fall out in a day. He must provide an apparatus whereby that row of warp threads which at one time was forward at the next passing of pile loops is changed to the rear. This is what the ratch is to effect, and this it does, as well as two or three other important functions.

The figures which show the various manipulations in the fitting of the ratch are shown on Plates VII and VIII. Firstly, thin canes are inserted in the upper and lower *ched* on each side of the *joki*—terms which, being applied in the same way as for *dari*-making, need no further explanation. Fig. 6 shows two warps in different stages. That in which the ball of thread is seen shows the earlier stage. The two canes defining the *joki* are there shown with their ends tied together to keep them in position. This constitutes the *sikari*. These canes with the *joki* are lowered till they are about the height of the worker's head. Then two horizontal stout bamboo rods are fixed up as shown in the same figure. They are about two inches apart, and the actual method of suspension is not of importance. Together with the vertical sticks which separate their ends, they enclose a long narrow rectangle through which the warp threads pass. Two workmen now take up their places, one on each side of the erection. The chief worker stands on the side shown in the figures on Plate VII at the right edge of the warp as photographed. Fig. 1 shows as follows:—(*a*) a cord fixed at each end of the rod near the worker; (*b*) a ball of thread which he fastens by an ordinary knot to the string referred to at its right end; (*c*) he is about to pass the ball to his fellow-workman over the two wooden cross-pieces, going at this first essay to the outside of the outermost warp thread. Simultaneously he slips his left hand through the loop momentarily formed. With that left hand he will subsequently receive the ball of thread from underneath the cross-pieces. While this is going on it is the duty of the assistant to (i) detect any slack or broken thread, (ii) to see that by pushing each thread in turn a trifle towards the chief worker's right, the gap between the proper threads is at once evident to each of them in order to expedite work. This care of the threads

is much facilitated by keeping an eye on either of the thin canes tied up above. They serve as sight-lines for faulty threads. Fig. 1 therefore shows the chief worker about to pass the ball across. Fig. 2 shows a moment later how the left hand is awaiting the return of the ball. By looking closely it will be seen that, on its return below the bar, the ball passes between the first warp thread and the next. The thread which is thus surrounded by a loop is that which is nearer to the assistant. In all these manipulations only the threads on the assistant's side are referred to when looping goes on. The next Fig. 3 shows practically nothing more than its predecessor, until closely scanned. It represents however how, when the chief worker receives the ball from underneath, he has to withdraw it with a loop of loose thread hanging below it. Plate VIII, Fig. 4, shows this loop diagrammatically drawn out across the wrist of the receding left hand. He then pulls aside with the fingers of the left hand the cord attached to the cross-piece and slips the ball of thread through the gap thus made, all of which can be seen in Fig. 5. When this is over, he is in a position to start afresh, this time passing the ball between threads Nos. 1 and 2 of the back row as he passes over the bar. As the ball is returned under the bar, it emerges between Nos. 2 and 3, and is then interlaced round the tranverse cord as just shown in Fig. 5; then over the bar between Nos. 2 and 3 and under between 3 and 4. Thus it comes about that the two workers are wrapping round the wooden cross-pieces a continuous spiral of string, which in its course encircles one by one each of the warp threads near the assistant—the interlacing being only introduced to prevent side-slipping.

The next process is the withdrawal of the rear cross-piece. This bar being withdrawn, it follows that any forward pull on the front bar will drag forward all the rear warp threads, for each of these has been looped up to the front bar. The result is shown in Fig. 6 already referred to at the beginning of this description. The right hand figure shows the following: (*a*) the two canes tied by their ends to define the *joki* or intersection; (*b*) the ratch appearing as the lower transverse rod drawn out by cords so that the series of loops rests in a horizontal position; (*c*) between (*a*) and (*b*) is a third rod, while below it can be traced a secondary intersection of threads or *joki*. This intersection is merely the result of the traction on the lower cross-bar in the direction of the observer. The loops surround warp threads which originally were on the other side but which by traction have been pulled into the front row. If the intermediate stick or *dhum* be raised, the loops will tend to advance still more: if the upper *joki* be raised to the top of the frame and the *dhum* be raised up to it, still more will the loops advance and wider will the *ched* be that exists between the front and rear warp threads below the level of the ratch. If the opposite movements be made, namely, if the upper *joki* be lowered and with it the *dhum*, then the bulging of the *dhum*-stick will tend to drag the loops so far back as to cause the front threads to become rear threads. Mr. Brendon in his 'Woollen Fabrics' gives an excellent diagram. It is often stated that the object of the ratch and *ahum* is to procure equal traction on the two rows of warp threads. This seems hardly to be the case. As a matter of actual fact, the tension in practice is not equal, though both sets of threads are always taut. However it is true that the *dhum* does tend to

lessen whatever difference in tautness might exist. The main object is to procure an arrangement for the reversal of the threads.

Method of proceeding with the Weaving.—Let it be assumed that the *than* and warp are in the state shown in Fig. 6. For such a loom two weavers would certainly suffice and they would work on the proximal side of the warp. The instructor or reader stands on the other side, controlling possibly some three or four looms. Unless the pattern be quite familiar to him, he has near at hand a small sample or a design on squared paper. His duty is to see that the weavers affix the proper loops of wool in the proper places, and for their guidance he calls out what practically amounts to this :—Worker No. so-and-so, commencing three threads from your left margin put in two blues, omit three, four blacks, two reds, omit twelve, four reds, stop, fill in back-ground. All this will be explained later. He calls this out in vernacular and then rushes off to another worker and calls out to him a similar jargon. Possibly if the carpet be a wide one another instructor is calling out at another part of the carpet. Most certainly there will be other carpets in process of manufacture elsewhere in the workshop, so that altogether, what with the general volume of sound, the peculiar terms often used, the quaint vernacular of some weavers, and the general hurry and scurry of fingers, it is little wonder that visitors are apt to regard the scene inside a pile carpet factory as run on jail methods a most extraordinary sight.

Having seen that all the threads are taut, that they are properly spaced, that the loops of the ratch are correct, that the *dhum* works well, the weavers commence by hanging above their heads but within reach balls of wool dyed in the requisite shades. Each man will from time to time break off from such a bundle some fifteen inches or less of wool. With a dexterous manipulation of fingers he loops about two inches round certain warp threads, and then with a single downward sweep of a peculiarly shaped knife he cuts free the rest of the wool he holds in his hand. A few taps with the 'flat' of the blade of the knife beats the loop well down. The first six or seven rows of wool are generally of uniform colour, so that the worker has merely to insert a row of, say, white all across the warp and beat it down and after that add the *poth*, then reverse the warp, again beat, add more *poth*, then beat, reverse the warp once more, and proceed all over again some six or seven times till the entire initial band is completed. However it is necessary that the nature and use of *poth* should be made clear.

On the nature and use of 'poth.'—Theoretically, the warp threads are in two rows, a front and a rear. At the line of healds such is actually the case, even to the extent of two inches, but at the very line along which work is proceeding the defining of a rear and front row is apt to be difficult. Now the reader will understand that if the weaving were to proceed without any such appliance as a ratch, there would certainly be, even at the line of work, or the 'fell,' a certain narrow chink between the front and rear rows. If however any reversing arrangement, for example a ratch, be used, then on reversing the threads, although theoretically a chink would still exist between the two rows, in the latter case it would be much narrower. And being narrower, any thread introduced into it would

be extricated with much more difficulty than in the case of the wider chink. For similar reasons such a thread would be held much more tightly in the smaller than in the wider chink. Therefore, there are two forms of *poth*—a *kutcha poth*, that is, a strand of thread laid transversely along the *ched* of wider dimension, and a *pucca poth* or similar thread introduced into the narrower *ched.*

To return to the penultimate paragraph. A row of woollen loops is inserted across the full width of the warp and then with a *kanga* these loops are driven towards the bottom of the warp. (An omission—a *ahori* and *chiri* are introduced as in *dari*-making.) What is to prevent these loops from working loose in an upward direction? Each worker takes a strand of cotton yarn generally dyed in indigo and of about 3—5 fibres lying side by side, and this strand he inserts between the front and rear rows of the warp, the strand resting in the narrow chink as far as the mid-line of the warp. At that spot the unused portion of the bundle of yarn passes out from among the threads and hangs free for further use. From the other edge of the warp the fellow-worker has similarly passed his strand of yarn, but not till it has reached that passed by the first worker is it in its turn allowed to drop out from among the threads. This transverse strand of yarn, in two halves, one from the right and one from the left, is what is known as *poth*, or in other words, the weft. In this case it is *kutcha poth*, for its capacity for resisting dragging is less than that of the other sort of *poth*. On this *kutcha poth* being beaten home, the *dhum* is raised, with the result that the threads are reversed, and now a narrower *ched* exists than at the previous effort. The bundles of yarn left hanging after the passing of the *kutcha poth* are now picked up and each bundle is passed on in the direction formerly taken. Hence if *A* is working at the right of the carpet, he has passed his yarn as *kutcha poth* from the right edge to the centre. Then after reversal, *B* takes up *A's* yarn and passes it on from the centre to the left edge in the form of *pucca poth*, while *A* picks up *B's* yarn and works it in from the centre to the right as *pucca poth.*

The above description may seem tedious and unnecessary, but the correct laying of the *poth* being of great importance in a carpet, and the strength of a carpet more a matter of *poth* than anything else, the matter has been deemed deserving of full description. Mechanically, it would be difficult to conceive of any other plan of equal simplicity and efficiency, for what is *kutcha poth* on one side finishes up as *pucca poth* in the other half, and since it is securely interwoven into the sides of the carpet and passes from edge to edge, any tendency for the carpet to slit parallel to its length is well resisted. Nor can any piece of pile slip upwards or downwards, for there are two rows of *poth* above and two below.

In any carpet of undoubted excellence, the presence of *poth* in the finished article can only be made out after careful searching, while the plainer the *poth*, the coarser as a rule is the carpet.

On the Weaving in of Designs.—Having woven in the initial *patti* or band, the workers are eventually confronted with the task of making a pattern. With ninety-nine weavers out of a hundred this is a very mechanical matter, but for the one-hundredth the case is very different. With regard to him,

the master in his art and craft, no verbal description will explain how he gets effects of which he himself is quite ignorant, perhaps, as to means, but is fully appreciative of results.

For the man who stands on the other side of the fabric, and calls out the pattern, the matter is somewhat the same, though his work should never be quite mechanical. Even for him, if he be provided with a pattern which he has neither to modify in colour nor alter in dimensions, no special skill is needed. There are two methods of making carpets from designs or patterns in vogue—the squared paper method and the direct copying from another specimen. Of these, the former is generally practised outside jails, the latter method is with few exceptions that followed in all the Bombay prisons. The first is well adapted for all cases in which any alteration in relative dimensions is called for, and indeed is, in the opinion of the writer, the only safe method for ordinary workers under such circumstances. Assuming the squared paper method is being followed, the procedure is somewhat as follows.

Weaving from Squared Paper.—Squared papers having been mapped out for all the various parts of the design which are not mere repetitions, the foreman divides up the width of the carpet into two, three, four workers, as the case may be. As a rule one man is allotted two linear feet. The squared paper being merely a series of vertical and horizontal lines in which each vertical line has its counterpart in a certain warp thread and in which each horizontal line is represented in the actual work as a row of woollen loops, it is evident that the foreman has only to decide which of the main warp threads shall represent certain vertical lines in the paper design and where the corresponding rows of wool and horizontal lines shall be to enable each worker to proceed. Examples will possibly make this clear.

The foreman marks in red ink on the squared paper the vertical line bisecting the design. On the warp he finds which is the mesial thread and this he blackens. Then suppose three weavers are needed for the work, *A*, *B*, *C*. He will then ink off on the paper the line which separates *A's* work from *B*, and *B's* from *C*. Similarly he will ink corresponding threads in the warp. *A*, *B*, and *C* therefore clearly know the limits within which they are to work.

Now let attention be paid to the horizontal lines. Row No. 1 will be for the *dhori*, the next row is for *chiri*, then may follow five or six rows of uniform tint for the weaving of the *patti*. Now comes the actual weaving. The extreme edge of the border consists perhaps of a simple alternation in two colours, for example red and black. *A's* first row will possibly read thus: three reds, four blues, three reds, four blues, and so on till the whole of *A's* first line is completed. In this case too *B* will have similar work to do, and so would *C*. All three having conjointly finished the first row, the loops are beaten home with *kangas*, as used for *daris*, the *poth* is applied and beaten home, the ratch reversed, *poth* (*pucca*) applied, the *kangas* used, the ratch again reversed, and the warp is ready for the next row of loops No. 2. Now in this case possibly there is no mere simple alternation. In the paper design possibly *A's* second row starting from the left reads thus: two blacks, three greens, two whites, two blacks, eight reds, two blacks, and so on. In

such a case one of three things may happen. (*a*) If *A* is unable to read directly from a paper pattern, he will be given a slip of paper in which the design has been written out for him just after the manner in which a learner not knowing that a mark on the third line of the treble clef in music denotes *b* has his notes (*b* included) written out for him. (*b*) If he is able to 'read' the paper pattern, no such copying out is required. (*c*) If he is illiterate and cannot read in the ordinary sense at all, it will be necessary for the foreman or a fellow-worker to call out to him the requisite colours.

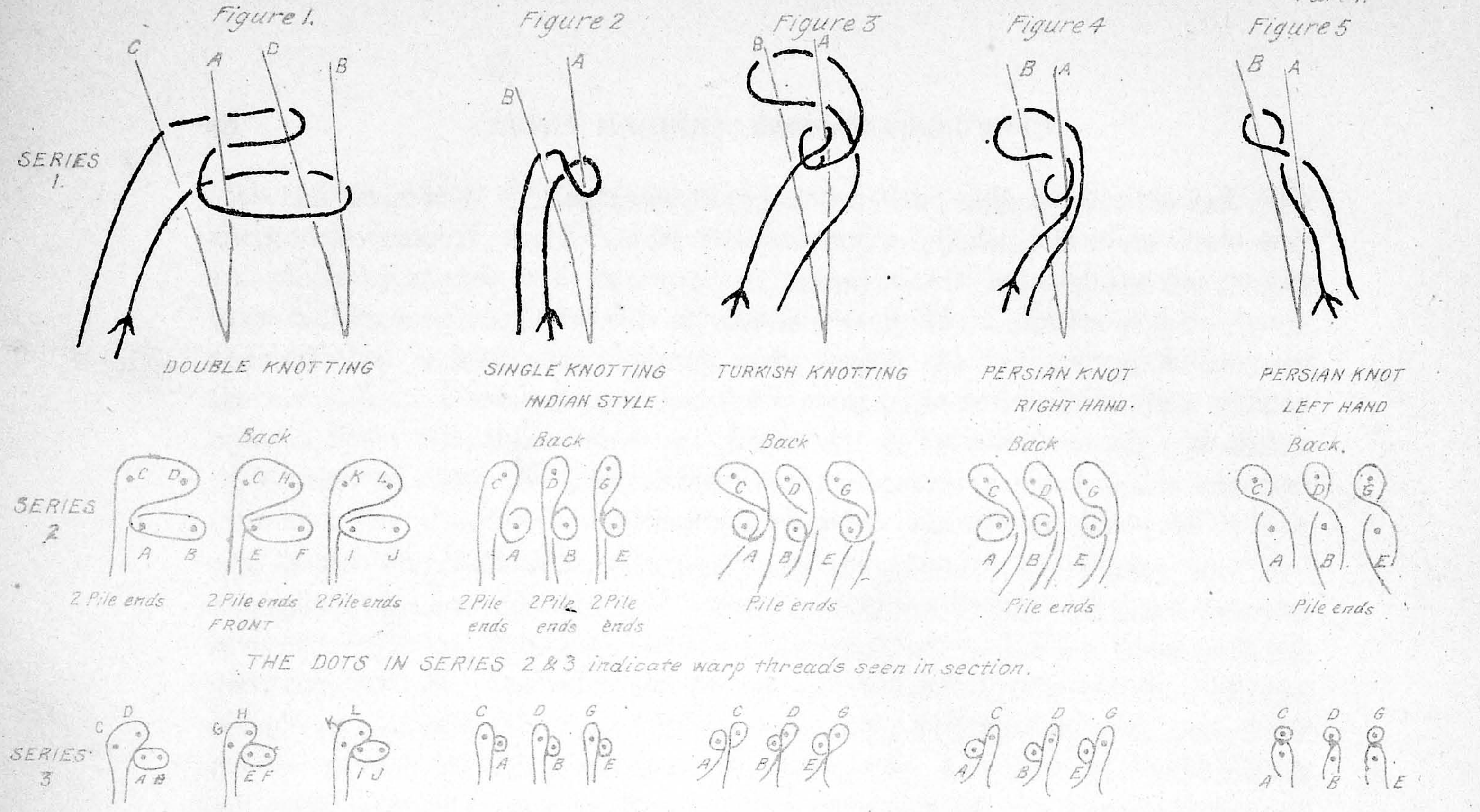
Now let it be supposed that *A*, *B*, and *C* are all quite illiterate, and that all they know is the naming of colours and the method of twisting the loops. Further, let the colour of the back-ground in the case under consideration be black. Now as *B* is engaged in the central part of the carpet, *A* and *C* have corresponding work on the left and right. In such a case the foreman will call out somewhat as follows to *A* and *C*: "Commencing from the outer edge, three reds, two blues, omit three, four reds, omit one," etc. etc. That means that *A* and *C* commencing from their respective edges insert loops according to direction, omitting what is the back-ground or any colours which are present in unbroken masses. While *A* and *C* are so engaged, *B* has been filling in his back-ground or large masses of uniform colour. The foreman now turns to *B* and calls out the requisite directions for him, *A* and *C* filling in their back-ground as this is going on. Then when the whole row is completed *kangas* are used and *poth* passed and the next row is got ready.

Suppose however the carpet is wider and *A*, *B*, *C*, *D*, *E*, *F*, and *G* are employed. Of these *A* and *G* will probably have the border and a lateral strip of the field to attend to. *B*, *D*, and *F* will possibly have corresponding fields to work on, and so will *C* and *E*. Proceeding on the same lines, these men will either have their own pieces of squared paper for direct reading, or the slips will be transliterated for them, or else the foreman will have to call out for *A* and *G*, for *B*, *D*, and *E*, and for *C* and *E* in groups. The same plan will be adopted no matter how numerous the workers. After about three rows of woollen loops have been passed the uneven ends are trimmed off to a common level with scissors, which work much more efficiently if the shanks are so bent that the handles remain parallel with the cutting edges although on a level about one inch and a quarter away from and in advance of their plane. The fingers which hold the scissors are thus just touching but not pressing into the part of the pile already cut. Dr. Bocarro of Shikarpur adopted this plan at the local jail and it has since been adopted elsewhere.

Passing of the Loops, or methods of Knotting.—The method of passing the loops is a matter that many writers lay much stress upon, especially as it is often asserted that by examining the manner in which the pile projects through the warp the origin and general value of the carpet can be arrived at. The writer after examining many carpets is inclined to consider such evidence of little practical value. As a rule, if a carpet is really good and closely woven, it is no easy matter to differentiate with certainty the warp, weft, and pile in the depths of such a closely spun carpet. On the other hand, if the pile is loose enough to admit of an immediate recognition of how the wool emerges from

METHODS OF KNOTTING

Part I.



REMARKS

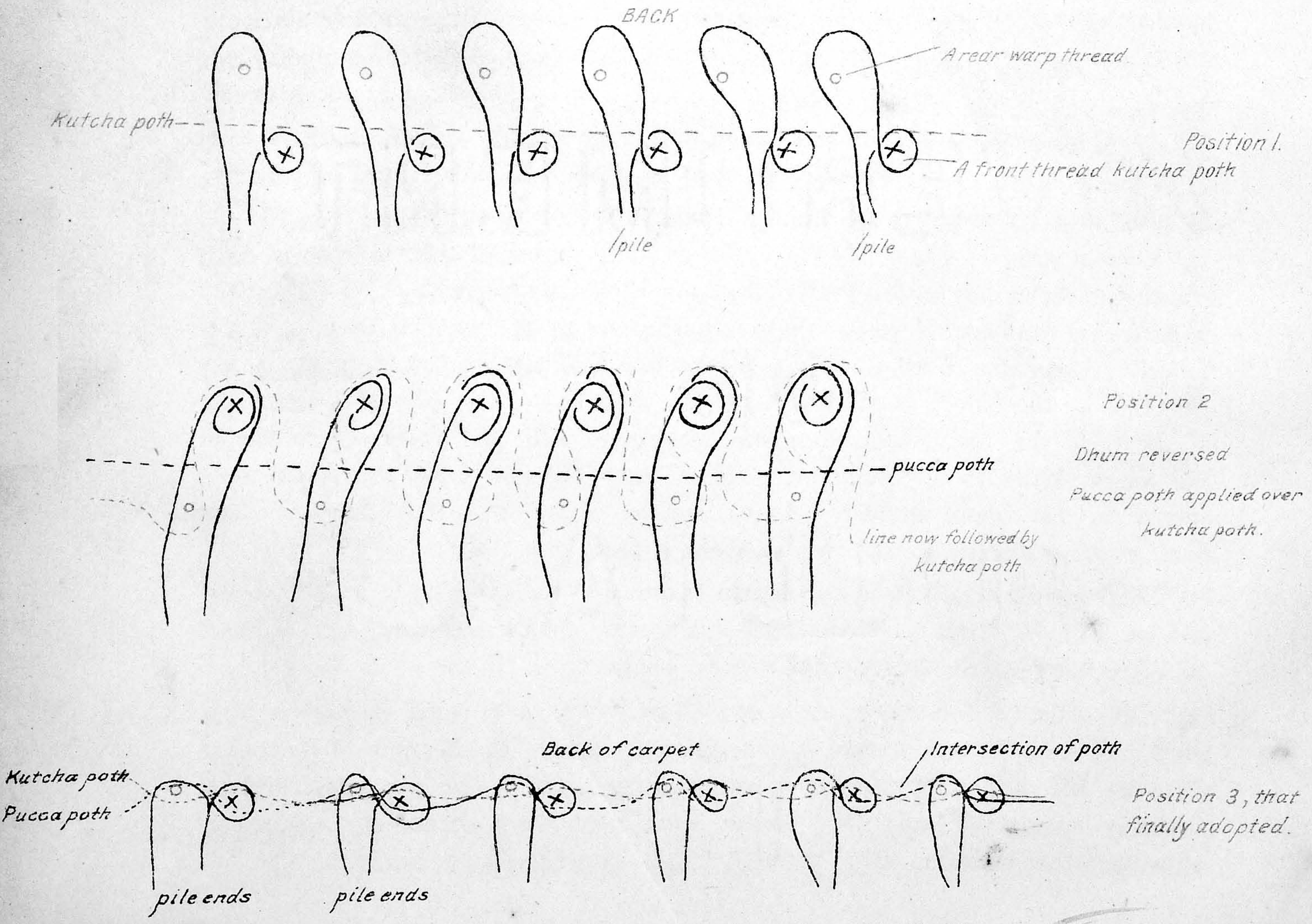
IN SERIES I The straight lines shew warp threads, the winding line the course taken by the woollen loops.

SERIES II Shews the same relation if viewed from above, the dots representing cut threads.

SERIES III Shews the approximate place permanently taken up by the threads and pile owing to the action of the poth and dhum.

WARP POTH AND PILE

PLATE IX. Part II



It will be observed that in this system of knotting one half of the warp threads have towards the pile surface no wrapping of wool but every warp thread is fully encircled by poth.

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warp and weft, the mediocrity of the carpet is established. It is usual to state that there are two methods of passing the loops. Most accounts of how the fingers are manipulated are confusing or incorrect, but the final results are always clearly affirmed. With a Ghiordes or Turkish knot two woollen ends are met with, then a warp thread, then another warp thread, and then two woollen ends. Thus the sequence is two wool, two warp, two wool, two warp, and so on. On the contrary, in the Persian or Sehna knot the result is such that one warp thread alternates with a woollen end, so that between every pair of warp threads there is a single woollen end.

The actual mode of passing the knot, as witnessed by the writer, will be best followed if the following assumption be made. Suppose the reader is looking over the shoulder of the weaver as the latter sits at his work with the warp in front of him, in nine cases out of ten the worker will act as follows. He will take in his left hand a piece of dyed wool about seven inches long, holding it about two inches short of the advanced end. With the right hand he will take hold of not two warp threads but four. Of these two are in the front row, while the other two will be corresponding rear threads. As a matter of fact, warp threads do not fall exactly into corresponding front and back rows though such is almost the case. For clearness, let the threads be lettered as in Plate IX, Fig. 1, thus, A, B, C, D, of which A and B are to the front with A to the left of B, while C is behind A and a little to its left. D is similarly related to B. As regards any further quartets of threads, for example, E, F, G, H, or I, J, K, L, similar relations would hold good.

The usual procedure for the bulk of Indian carpets would be as follows: the free end of the woollen strand is pushed behind A and B passing A to its left side: the wool then comes to the front between B and E, then across the front of B and A and across to D where the wool passes between D and G, then behind C, after which it comes to the front on the extreme left alongside the remainder of the woollen strand. Plate IX, Fig 1, Series 2, will perhaps make this clear. The clipping of the excess wool in front of A clearly leaves two pile ends. It is important to note that the figure depicts only the appearance of the woollen loop as it lies loosely among the warp threads. In practice a certain amount of pulling on the free ends by the fingers is effected before the knife leaves the pile ends free, and in addition, the presence of the *poth*, together with the reversing action of the *dhum*, leads to a permanent position very different from the appearance shown in the figure quoted. Later figures show with fair accuracy the final position taken up by the woollen strand.

This procedure is known as 'double knotting,' or working with *jhuthi bharni* or false filling. Large uniform masses of colour and the general back-ground are often filled in after this method to save labour.

The other procedure adopted is as follows:—A loop of wool is passed from the left of A completely around it, then obliquely across to the right of C, behind C to its left, and then forward to the starting point. The next woollen loop similarly engages B and D. Hence each front warp thread is 'encircled,' while each rear thread is only 'backed.' See Plate IX, Fig. 2, Series 2.

This procedure is 'single knotting,' and is the only correct method. To adopt it profitably the wool must be spun in a bulky cylinder, and to do this loosely and evenly by hand actually requires years of practice. Only by machinery can loose bulky though light woollen strands be evenly spun. In the end the hand-spun fibre is far better, as it proves more lasting, the initial even fluffiness of the machine-spun wool giving place in a comparatively brief time to a shreddy appearance. Text-books refer to Ghiordes or Turkish knotting and Sehna or Persian knotting, the latter falling under a right-handed and a left-handed system. The diagrams showing these methods appear on Plate IX. It is said that in the Turkish system if the pile be examined it will be seen that two pile ends emerge between two warp threads, but that before the next pile end is found two warp threads are to be seen. Then come two pile ends and two warp threads and so on. In the other method the sequence is said to be one pile one warp, one pile one warp. In practice not many people could convince themselves of these facts. A reference to the figures will show how very similar are the final appearances. Over and above the procedures described there is another device which can be applied to either of them, namely, what is known as 'double threading.' Just as when a button is to be sewn on lightly a single thread of cotton is used, whereas if the sewing is to be strong the cotton is doubled. In a similar way in order to get over the ground quickly the woollen loop is re-duplicated by folding it back on itself just as a hair-pin is bent back. With the wool thus doubled, the work proceeds as above Generally double threading goes with double knotting alone, the adoption of the method with single knotting depends to some extent on the pattern under consideration.

At Bhubak this double threading is carried much farther, even to six strands of wool, while the *poth* is extremely thick.

Plainly under the double threading system four pile ends are freed at each sweep of the knife.

Plate X, Part II, shows in a diagrammatic fashion the relation between warp, wool, and *poth*. (Position 2 is not quite correctly shown—if right and left handed relations were reversed the diagram would be correct.)

CHAPTER V.

Dyeing.

There is no more important branch of the craft of carpet-making than that of dyeing, and it is equally true that no branch of the work is less capable of mere literary description. Trade returns, raw materials, the actual weaving, can all be more or less satisfactorily dealt with by verbal description; when it comes to dyeing it is found that real true explanations of the processes are rarely available, and even the workers themselves have little by way of explanation with regard to their methods.

In the literature of carpets and rugs it must be confessed that references to romance, poesy, and mysticism occur almost *ad nauseam*, and it is particularly in connection with the colouring of carpets that most of this style of writing has arisen.

If ever there were a craft carried out on mainly empirical lines, it is the craft of dyeing. It is true that many of the methods in which aniline, alizarine, and allied tinctorial agents are used are grounded on scientific chemical knowledge. Thus it is that the results to be expected from such agents are far more likely to be attained than with other tinctorial substances. Undoubtedly it is to some extent a case of separating essentials from adulterants. The real nature of dyeing is still a matter of dispute, and is in fact as truly fundamental, and therefore difficult of demonstration, as the allied problem of why certain microbic forms readily take up one class of stain and are quite indifferent to other classes. The term 'affinity' is freely bandied about in discussions connected with either of these problems, though no mere conjuring with a phrase constitutes a real solution.

To those whose mental equipment includes a taste for discovering instances of the wide application of general laws, the manner in which vegetable dyes prove fast while aniline dyes are generally otherwise, suggests another example of the law of the conservation of energy. No matter what theory may be adopted with regard to the ultimate nature of dyeing, there can be no doubt about one fact. With those dyes in which the simplest processes suffice to produce the required tint, such tints are generally the most fleeting. With those which require the most labour, or, in more general terms, with those on which more energy is expended, the tints attained are more fast. Within general limits the above propositions appear quite true. Not only is it true as regards aniline, the same is true for vegetable dyes. Contrasting aniline and vegetable dyes as groups, the dullest observer must appreciate how the fleeting aniline tints need less energy to be expended in their use than do the faster vegetable tints. Among vegetable tints the easy tinting with fleeting *kasumba* compared with the very laborious methods of *manjit* dyeing, a dye however of the fastest character, point to the same conclusion. Among anilines and similar

dyes the same also holds good; in fact, there are now on the market chemical dyes of a superior sort which yield tints almost if not quite as fast as some of the corresponding vegetable tints. Two things only render such dyes still a source of danger—the price; the brilliancy. Reference will be made to these points later. There is something very suggestive about certain facts connected with vegetable dyeing. After due allowance has been made for tradition, for imagination, for resistance to innovation, for so nebulous a matter as general taste; after allowing for all these, it must be conceded that there is associated with vegetable dyeing an undefinable something which aniline dyeing lacks. At the very time of writing there is in the prison factory a small carpet of which replicas are common enough. The design is good though not inordinately so; many equally good designs abound. The carpet is at least twenty years old, as proved by entries in a private diary. The fabric was made somewhere in Western Persia, evidently where bad work was beginning to be the rule. The wool is fair, but the weaving is distinctly bad. And yet that carpet could be picked out at once by even a novice as superior to most. Why is this so? The dyes are excellent. All have faded. Of that there can be no manner of doubt. Even the blue back-ground of the field is obviously streaked. The dyes however are essentially the charm of the carpet. Even the streakiness in the blue looks admirable as it conveys an impression of strata of deep blue water. The same carpet in aniline would look positively abominable in spite of the excellent dyes now chemically produced. Very likely, two new carpets, one in the best aniline and one in the very dyes from which the carpet under reference was dyed, would look very much alike, and indeed not a few persons sharing in the reaction which has now set in against dull colours in certain quarters would prefer the aniline—but what a difference in twelve years! It is true that not a few of the very best chemical dyes have been so recently introduced that sufficient time has not passed for an unbiassed decision.

The skilful modern chemist cunningly separates the essential colouring agent. Still it may well be doubted whether in the process he does not fail to retain one of those residual substances which in so many investigations persistently evade analysis. For example, till quite recently, the phenomenon of blood clotting seemed to be not very elaborate; there were in the blood known to be this and that and the other and certain other ill defined substances; in the phenomenon of digestion there have recently been found bodies which make the problem less simple than was formerly thought to be the case; undoubtedly the finest rootlets of plants in their power of selecting chemical substances from the soil are infinitely more sensitive than the keenest chemical research. Well might the chemist in making his aniline dyes destroy or neutralize many of those undefined bodies which, after the manner of the residual bodies referred to, continue to evade investigation.

In the set of questions addressed to all talukas several questions were devoted to the subject of dyeing, and to reproduce all the replies in series would prove most wearisome, especially as there is great unanimity in the answers. From no locality is it reported that the art of dyeing after decline has improved; when once a decline has set in, no recovery has occurred. In practically every case

the main cause is the introduction of cheap chemical dyes in the local bazar. Or if this cause does not kill the local craft of vegetable dyeing, the importation of cotton already dyed produces the same effect. In fairness to certain dyers as well as buyers it must be confessed however that the superiority of vegetable dyes is freely acknowledged. What is disliked about the aniline-dyed article is not at all the brilliancy, and equally so not the cheap price, but the rapid and uneven fading of the aniline. If only vegetable tints could be produced at a low cost, aniline might still among certain communities find it hard to maintain its place. In certain parts of Sind in which *babul* forests abound, lac, in spite of the tremendously enhanced cost, gives results so incomparably better than any aniline substitute that there is little fear of its displacement. In certain remote parts, such as Ratodero and Thul in the northern part of Sind, vegetable dyeing still persists. For the great bulk of the Presidency vegetable dyeing is truly dead.

Among art schools a mixed practice is adopted. The Art School at Bombay maintains a dye-house and the wools shown during an inspection were excellent. This removed the unsatisfactory impression formerly held by the writer that this Art School which turns out carpets which, regarded purely from the point of view of the artist, are probably unrivalled in the Presidency, entrusted its dyeing to an outside agency. It was expected, if a candid statement be allowed, that the weak spot in the Art School practice would be in the colour work, and that in designs the school would certainly excel. The impressions received after making a brief visit were rather reversed. The orphanage at Surat reports that it too uses vegetable dyes, though it is not clear whether aniline is completely excluded. Certain other institutions, as for example the two carpet-making institutions at Ahmednagar, avowedly use aniline dyes, and in not a few cases the wool is received already dyed from Northern India or Bombay. All the Gujarat institutions, except the Surat Orphanage, use aniline. The reader who is desirous of further details should scan the pages of Mr. Fawcett's 'Monograph on Dyeing,' and if he then triplicates all the remarks anent the advance of aniline to the displacement of vegetable dyes, he will arrive at a very fair estimate of the present state of affairs. Unless something is quickly done it may be safely predicted that, except at one or two jails and at still fewer free institutions, in ten years time the art of vegetable dyeing will be hopelessly lost.

Unfortunately that is not all. The very men who knew vegetable dyeing are now old; their children with rare exceptions discard a craft which labours under many disadvantages; still worse, the very raw materials whence the tinctorial agents come are either going quite out of cultivation, are deteriorating, or are getting excessively costly. Any combination of these factors has to be dealt with by the man who would resuscitate vegetable dyes. To a slight extent indigo holds its place on its own merits, though the superior attractions of cotton cultivation are reducing the acreage under cultivation in Gujarat and the Khandesh districts. An article such as turmeric survives, though solely on account of its demand for other purposes. *Kasumba* has apparently greatly deteriorated in quality, while *al* and *morinda* have both deteriorated and become scarcer.

The only dye agents of vegetable origin which have not suffered are various articles such as myrabolan and pomegranate, that is to say, agents whose main use is to obtain an astringent effect, and various hardy dye plants calling for no special cultivation, the neglect of which has resulted in no important deterioration.

In the jails, the Yeraoda Central Prison easily ranks far ahead of all others in the excellence of its dyeing. Dyes allied to aniline and alizarine never enter within its portals, and the heaps of cheap brilliantly coloured *daris*, which only too often in the past have largely made up the output of other jails, never pass out through its gates. No matter how favourably impressed the visitor may be with the exquisitely dyed woollen goods, he must own, if he be quite candid, that in certain other jails the wool is dyed nearly as well, with the exception possibly of a colour or two. It is essentially in the *daris* that the tremendous superiority of Yeraoda dyeing over all other is most plainly seen. A plain *dari* dyed in indigo at Yeraoda almost shows its factory at first glance by the dyeing. There are certain Native States within which carpets are made. In all of these the colours used in dyeing are most obviously of aniline. This is a great pity, for the weaving is as good as the dyeing is bad, while the designs though often copied from Western sources are wonderfully true to the pattern.

No mention will be made of any dyeing recipés, for an account of the same would be especially wearying and of no practical use whatsoever. It is only at the dye-shed itself that dyeing can be learned; and only there is its study really interesting. For cotton Mr. Fawcett in his work makes amply reference to processes, but he designedly gives no account of how wool is dyed, inasmuch as wool dyeing takes place practically in jails alone. As a matter of fact, there is but little to add to Mr. Fawcett's account even though it enters into no details.

In order to demonstrate the essentially practical character of dyeing let it be assumed that the observer is being shown over a dye-shed with a rough working note-book in his hand. His attention will probably be drawn to facts such as the following:—A very important item is the preliminary cleaning in a mixture in which alkalis greatly preponderate, called a 'rot-steep.' A correct temperature for the dye-bath and the exact length of time for each process are pieces of knowledge which practice alone can supply. The observer may not have the least knowledge of the processes himself, although when looking on, the varying results incurred by errors as regards temperature and time cannot fail to be noted by him. Every little process, no matter how apparently simple, seems to have its right and wrong way. The wool after immersion in the rot-steep is taken out. It is then well washed in running water, and is during the process vigorously beaten with heavy wooden elongated mallets called *moghras*. [In Plate X, Fig. 2, two workers are seen thus engaged.] The mass of wool on the ground has come from the rot-steep, and the third worker adds water while the beating goes on. Then the wool is put into thirty gallons of cold water in which a pound and a half of alum has been dissolved. Unless this is properly mixed before adding the wool, the best results are apt to be missed. "After an hour take out the wool and rinse." Now the instruction to take out the wool after an hour, as well as the strength of the alum solution, are general

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PLATE X.

Dye-shed Scenes.

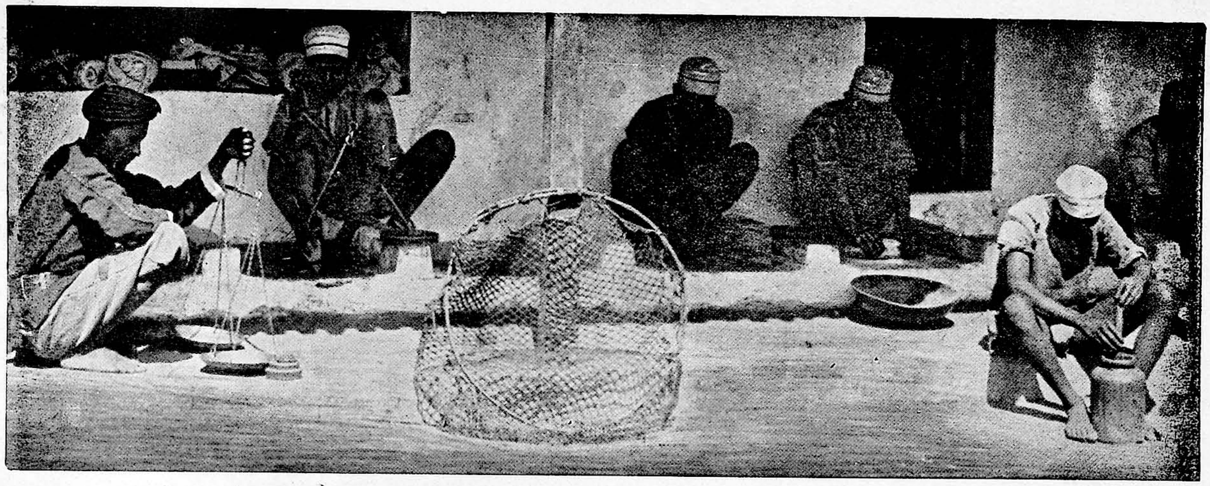

Fig. 1.

Workers engaged in grinding powders, making solutions, weighing ingredients, or straining liquors.

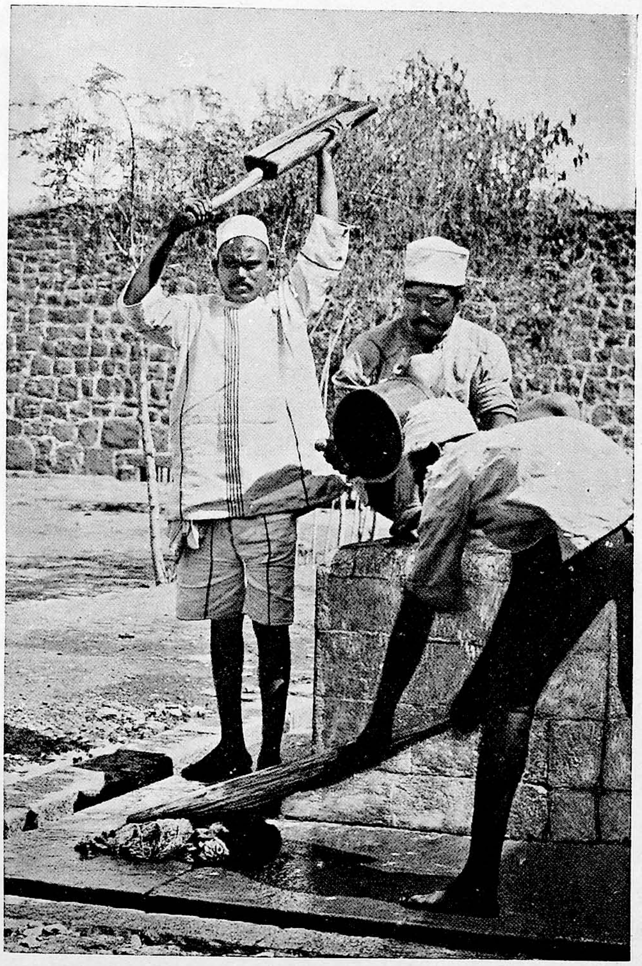

Fig. 2.

Workers beating dyed material with heavy mallets or *moghras*.

instructions only and hypothecate a certain stoutness of spun wool as well as a certain excellence of spinning. Any deviation therefrom calls for an adjustment in one way or another of either the amount of alum, or the time, or of both, and only the practical worker has the requisite knowledge, nor can writing impart it. The wool is then taken out and rinsed. Even this rinsing needs care, as is evidenced by the scrupulous manner in which each skein of wool is raised out of the liquid, and then the extreme ends are rotated in opposite directions. Thereafter sticks are passed through the ends and still more rotation effected; though whatever the force applied, care is always taken to squeeze evenly and to avoid all unnecessary entanglement of the wool. Unless such be avoided an even exposure to the action of the dye is almost impossible.

Generally after rinsing it is necessary to dry the material. To do this involves a very careful shaking out of the skein, effected by the worker holding it with his right hand and then so shaking his wrist after the manner of one giving light flicks with a riding whip, that the lower free end of the skein just taps against the left hand at each shake of the wrist above. This serves to free the rows one from another, whereupon another part of the loop is grasped, and so the process goes on till the skein is evenly loosened. Thus is the whole prepared for hanging on the line. This again needs judgment, as a certain intensity and direction of light are called for. Then too the drying must be relative, not absolute, calling for a gentle sprinkling of water on the too rapidly or unevenly drying skein. Then the wool is boiled in water containing lac powder and tamarind for a certain period. It is afterwards removed and washed in 'fifteen waters.' This term is common among dyers and means that if a tub of water was taken originally to hold the dye solution the washing out of excess dye is done by passing the wool through fifteen such tubs of clean water. It, like all dye instructions, is only a general order and varies in practice with changes in the wool, spinning, and other factors. The boiling in dye liquor too involves an amount of stirring which must not be excessive though it must be evenly carried out. This necessitates that each worker must know just where he should stand among his fellows and where he should remain, for the unguided stirring up which a band of enthusiastic novices would provide would have but sorry results. The stirring must be even, gentle, and yet sufficient.

Then comes a boiling with cochineal and another rinsing to be followed by immersion in a solution of oxalic acid till of the desired strength. In particular does this last instruction illustrate the essentially practical knowledge needed. In the first place the mere immersion is no easy matter. Suppose four skeins of wool each of ten pounds are to be dipped. Each skein is taken by a worker who, slipping his opened hands inside the loops till the finger-tips meet, and shaking the loosened skein open so that the loops cover his wrists with as much of the arms as possible, leans forward over the solution and lowers the end into the liquid. Then by rotating one arm over and over its fellow he imparts to the skein a revolving movement. Each worker stands round the cauldron and does likewise, thereby guaranteeing not only an even distribution of the dye to the fabric but also keeping the bulk of the liquid in constant movement. An equal strength of solution is thus guaranteed. Further, by immersing all the

skeins at once, the probability that the depth of colour in the skeins will be equal is increased. At no time is it easy to guarantee equal dyeing, seeing how the raw ingredients contain many accessory substances whose influence is not fully known. It is therefore essential in vegetable dyeing that the entire consignment of any one colour should be done at the same time from materials equally distributed among all the cauldrons and vessels used, and that delays and alterations should be avoided as far as possible. And as regards the instruction that "the wool is to be immersed till of the desired tint," many are the devices whereby the expert working under factory conditions is able to know when to continue and when to go on. The sample, it must be remembered, is usually a dry piece of coloured wool. He has to decide when a piece of wet wool has attained such a tint that when dried it will be indistinguishable from the pattern. And in passing it may be added that the extreme delicacy of discrimination which some of these men possess is almost incredible. That they can differentiate and do not guess there is positive proof. The man in charge will from time to time pull off a fragment and compare with it a piece of equal area from the pattern. He notes as if by intuition how as time passes the tint approximates to that desired. He notes how as the temperature of the bath falls such change still occurs though less rapidly. As the tint is being approached, he quickly pulls out three or four threads of wool. These he separates, and places them probably on the neutral-tinted cement floor of the yard at a spot where the sun has raised the ground temperature. In the wind and sun the threads dry rapidly, and while this is occurring he adds others. Matching carefully but quickly he orders the wool to be rapidly taken out. All this, it need hardly be said, calls for a knowledge which, if empirical, is at all events essentially practical.

The processes of aniline dyeing are comparatively uninteresting and will find no further mention here.

Plate X, Fig. 2, has already been referred to as showing the workers beating with *moghris*. Fig. 1 shows workers engaged in grinding powders or weighing out ingredients. The man stirring something in a jar is preparing sulphuric indigo. The coarse net is used in one of the processes for indigo dyeing. Unfortunately the other photographs failed. The dye-shed too, admitted an altogether unsuitable light for photography.

It is unnecessary here to give in detail the processes so clearly set forth by Mr. Fawcett. They end, so far as the carpet weaver is concerned, with the drying of the dyed material, whereupon it is returned to the workshop, and after being re-arranged in working order participates in those various manipulations which have already been described in the chapter on Construction.

The two colours for which Persian carpets were famous are blues and greens. Persia's national colour is blue, and most carpets from Iran of other than quite recent make contain much blue in their composition. But the blue is *sui generis*. It has often been referred to as a deep cobalt blue, and certainly when once seen is not easily forgotten. There is a depth of brilliancy about it not found in any blue derived from any other source. Its preparation is unknown to the writer, happily the method seems not to have been totally lost. There is also a shade of green found

only in Persian carpets. The making of this shade seems now to be absolutely unknown, nor can any carpet be called to mind which undoubtedly contains the colour. Doubtless museum specimens exhibit the shade. Of colours characteristic of former Indian carpets the red of bright *manjit* seems in real danger of going the way of the Persian blue and green. The process of *manjit* dyeing is of most extraordinary complexity, and really some of the recipés examined have been found to be so loaded with processes and repetitions of processes that the quiet introduction of a little 'foreign dye,' as aniline is euphemistically termed, has almost escaped scrutiny. At Yeraoda emphatically no aniline is used at all for *manjit* red. As certain other smaller jails were reputed to turn out a much brighter and a fast red without aniline, the methods were examined and found not quite correct. Yeraoda is still endeavouring to sharpen up its *manjit* red.

There is hardly any need to describe here the nature of mordanting. It will suffice to state that a mordant is an agent which by its application makes ready the thing to which it is applied for the taking up and retention of dye. It is essentially preparatory in its function. It is like the roughening a carpenter gives to the surfaces of two smooth boards before he applies glue and fixes them face to face in a press. In former days not only was the true dyeing done with purely vegetable dyes, also the very mordants were of vegetable origin. It is true this arose from several causes—vegetable products were undoubtedly to hand; astringent substances in these products were also found useful; chemicals, such as proto-chloride of tin or alum or copper sulphate, were not as easily procurable nor as pure. And so it came about that the process was formerly entirely carried out with vegetable substances, whereas to-day even in those few institutions where to their credit it can be said no aniline whatsoever enters it is only too true that in the mordanting and in other subsidiary processes non-vegetable agents are used where formerly vegetable agents alone were employed. The amount of time needed, the re-duplication of processes, the varying composition of the agents employed, the entirely empirical character of the methods, all these factors, it will readily be conceded, made collectively an obstacle in the way of purely vegetable dyeing against which it had little hope of success. And all this, it should be carefully remembered, refers not to the dyeing proper alone but to the mordanting and similar processes.

Formerly every process from first to last was a matter cf guess-work and needed much time. The introduction of alum and tin revolutionized the mordanting process both as regards rapidity of action and certainty of result, fully as much as the introduction of aniline in the place of *al* and *manjit* produced more rapid and certain tinctorial effects. It must be confessed however that in some respects the disadvantages of the new style of mordanting are as real as the drawbacks attaching to aniline. The almost universal practice in places where not a trace of aniline enters is to carry on the mordanting with purely chemical agents. To revert *in toto* to vegetable mordanting is as unlikely as a reversion to the dyeing of woad. And a remark by Sir George Watt is well worthy of remembrance, that in spite of tradition it is highly probable that the famous purple of the ancients, 'the purple of Tyre,' was not by any means of surpassing excellence, and that, taking all things into consideration, fully as much really bad dyeing was done

in ancient days as is carried out now. From the nature of the conditions only the superior has survived long enough to gain a reputation.

This method of mordanting with chemical substances undoubtedly yields results inferior to the old methods. There is no doubt that such substances as chunam, sulphuric acid, oxalic acid, alum, tin, exert a harmful effect on wool. The action of these agents seems to be directly on the wool itself, whereby are partially explained both the rapidity and the certainty of the effects. The older methods seemed to work some change in the wool itself fully as lasting though without any deleterious effects, the action of the agents being applied very slowly and possibly in indirect ways.

How thoroughly chemical methods have replaced older systems—a change which has its counterpart in the newer methods of pharmacology (in which, however, everything has been entirely for the better)—can be seen in the statistics regarding the sale of aniline. Figures are however wearying things, and in tables are often most fallacious. A more interesting index is however furnished by a perusal of the latest article on Dyeing in the Encyclopædia Britannica. If this article be compared with the penultimate issue it will be noted that whereas the earlier article discusses at some length the somewhat uncertain methods of the old system and makes only a short reference to aniline methods, the latest article deals so very extensively with the newer ideas that the brief reference to vegetable dyeing at the close is very apt to be entirely overlooked. And not only does the change apply to material alterations: a reference to the article will show that the alteration is deeper still, and that our very deepest thoughts on dyeing have been revolutionized.

To pick up an old carpet dyed after the old methods and carefully examine each colour is a most profitable occupation to any one fairly well versed in carpet literature. The allegation that aniline dyes fade, and fade unequally, is not an easy charge to prove for all colours, while the assertion that vegetable shades are fast is most certainly untrue. After examining very many old carpets the writer is quite convinced that the fading of colours which always takes place greatly adds to the beauty of the fabric, and equally that anilines do fade both rapidly and uncertainly. The following list will give the reader some idea of what vegetable tints fade little and what fade much. All colours having lac as an ingredient are very fast. Blacks too are very fast indeed, and generally the wool wears badly. Greens are fast even after years of wear. The tints known as *khaki rang*, *kala guni*, and *manjit* are also quite fast—in plainer terms these may be described as an olive brown, a blackish blue, and a reddish brown respectively. The tint known as China blue, a light Cambridge blue, is very fleeting. *Jangali* is hardly less so, while *kasumba* is probably the most fleeting of all. The former is a greenish yellow shade, while *kasumba* is seen in the bright pink turbans and *saris* so commonly worn. If any of these colours with the many intermediate tints which abound in carpets be closely examined, there will be seen, if the fading is satisfactory, a considerable difference in the depth of colour at the free end of any piece of wool compared with the colour where the piece emerges from the *poth*. In very case from base to tip there is a gradual shading off. Furthermore, in any square inch of

uniform colour such fading as occurs will be found to be uniform, or if at all streaky, there will be no abrupt lines of demarcation. They convey general impressions rather than decided optical effects. With aniline this is not so. The fading in any one fibre shows at times an abrupt transition. The shade of a field of pile is apt to be spotted, while the general effect is unpleasant. This is not a little due to the fact that as most aniline colours are very bright, any fading, whether equal or unequal, as regards the entire length of a piece of pile, or of three or four abutting pieces of pile, is only too apt to have as a setting a mass of colour of vivid brilliancy.

The probable effects of the introduction of aniline on the carpet industry will be discussed in a later chapter.

CHAPTER VI.

Miscellaneous.

In Chapter IV the general practice followed in the making of *daris* and *galichas* was described. Variations from such general practice, together with numerous facts regarding subsidiary points, form the subject-matter of this chapter.

Variations in Looms.—With regard to looms there seems to be little variation throughout the Presidency, and indeed throughout India, for the horizontal loom for *daris* and the vertical for pile carpets are the only forms met with. Indeed since the days of Abraham the looms used in the East have changed but little in general design. Carpet-weavers are very chary of any attempted change in practice, to illustrate which the following case is adduced. In Northern Persia a few years back the proprietors of a well-organized concern introduced a special instrument which, working somewhat after the manner of a safety razor, enabled the operator to cut the pile to the exact length, while it prevented him from leaving it too long or uneven. The instrument saved little if any time though it was certainly very economical in reducing wastage. Yet the workers would have none of it, and although it concerned their pockets far less than those of the proprietors, they persisted on strike till the innovation disappeared. Much the same spirit pervades the whole carpet-weaving community in India. The most primitive loom on record is probably that referred to by Sir George Birdwood, who once saw a weaver working at a horizontal loom of which his own body formed one end, the warp threads being fastened ahead of him to a beam in the ordinary way, while the other end was encircled round him. By receding from the beam as far as possible he maintained the requisite tautness. Erection in a workshop is by no means necessary, for in Northern India to a great extent and in the Deccan to a slighter degree vertical looms are erected in the open air, the horizontal branch of an overhanging tree making the upper beam. Such looms however are only used for coarse work and where there is no need for rolling or unrolling the warp. The cost of a loom depends chiefly on its width, a loom not more than ten feet wide costing much less than one-fourth the price of a forty-foot loom. The latter will call for an expenditure of Rs. 120 in timber alone, with an extra Rs. 30 for a masonry pit, while a loom of less than ten feet in width will not cost more than Rs. 25.

Variations in accessory parts.—In one respect only does there seem to be any variation as regards the accessory portions. It appears that in some places a double ratch is in use for vertical looms as well as for horizontal. The effect of such a double ratch would be to more widely separate the two rows of warp threads, while possibly it also guarantees equal tautness in the two rows. The introduction of the second set of loops very much complicates the warp,

and in addition calls for an expenditure in labour and material which in most factories is avoided. A double ratch is or has been used at the Art Schools of Bombay and Ahmednagar, but in other factories the single ratch as shown in the illustrations is used. Facing page 430 of Watts' 'Art at Delhi' will be found a very good representation of both the double ratch and of the general picture presented by a vertical loom during working hours. The tools in general use are well shown in the same illustration.

The methods of 'opening the twist,' 'twisting the thread,' 'spreading the warp,' 'making the ratch,' 'spinning the wool,' and other subsidiary processes appear to agree in most points in all reports. One characteristic is common throughout, and indeed is seen in nearly every indigenous craft, and that is the extremely rough implements and plant called into use. That a mechanism can be made from materials which can be picked up here and there by mere searching about the workshop, and that the same should be capable of repair by equally inexpensive methods, seem to be the two essential features of every piece of plant in a native workshop. No doubt the imperative necessity of the avoidance of any expenditure of cash is the prime factor in this practice. Of course in an art school such a rule need not hold good.

Facts connected with Training in various stages.—With regard to convicts, visitors in the carpet-shed generally ask the following questions: Do these men know anything of this work before admission? If not, how do they learn? How long does it take to train them? How do they know they are putting in the right colours? Can they make a carpet longer or broader than the carpet they are copying? Do they make any use of their acquired knowledge after release?

Invariably convicts know nothing whatsoever about carpets prior to admission, nor do they seem to have much desire to maintain the acquaintance after release. If a convict of long sentence shows some indication of a good colour-sense, has nimble fingers, and is generally intelligent, such a man is drafted into the carpet shed. There he learns, first of all, the spreading of the warp threads. It is probable that he has already learned in another factory in connection with other industries how to 'open up the twist' and how 'to twist the thread.' These processes are taught to convicts engaged in ordinary cloth weaving and can be learned in about six weeks by most beginners, though a year will hardly suffice for the acquisition of real nimbleness.

At first the learner attends to *dari* work only, and having mastered all the simpler processes, he is put on to ratch making. At the beginning of this work he merely acts as an assistant, holding up supports and passing along rods and so on; afterwards he takes a share in the actual manipulation of the threads intimately concerned in the work; then under supervision he makes a ratch for himself. During these periods of training he has been consciously or unconsciously learning much about colours and designs. His first attempt at *dari* making will be with a pattern in simple transverse stripes. Such a task will obviously be very easy, for he has only two or three absolutely diverse colours to work with and is restricted to a design of complete simplicity. He therefore in this design learns

little more than the mechanical application of yarn followed by the necessary beating with the *kanga*.

His next *dari* will be of the chess-board order, and in this he will be called upon to observe just where there is a break in colour both in a lateral and in a vertical direction.

His next *dari* will not be restricted to squares. It will take him as far as rectangles, work which is similar to what he did on his second class of *dari*, though calling for more attention when the colours change.

His fourth class of *dari* includes very many patterns, often of no little complexity though in every one it will be discovered that all the lines run either parallel to the edges of the *dari* or at right-angles thereto. This stage is therefore only an advance on the last. It represents the completion of the learner's first course.

The next *dari* will consist for the most part of lines parallel to the edges, with here and there a diagonal line. Such a line calls for completely new work as a careful counting of threads is necessary. Mere observation of a fellow-worker however generally suffices, and when once the learner has acquired the necessary knowledge another large group of *dari* designs comes within his grasp.

As a rule the worker goes no farther than this stage. Now and then a man can be found who possesses the faculty of mentally depicting curves and figures not restricted to straight lines. Such a worker has probably made very rapid progress throughout the earlier lessons, though the same have by no means been wasted on him, for he has during his tuition become nimble at picking up threads and passing yarn. It is such workers who turn out the superior *daris*. For this class of work care must be taken in every detail, there being for each pattern a correct thickness of warp thread, a correct number of such threads per linear inch, a correct closeness of weaving as regards the dyed yarn. And these three factors are inter-dependent, or the pattern will not work out correctly. A full explanation of this will not be given here as much technicality would be unavoidable. An extreme case, exaggerated in order to make the point clear, will suffice. Suppose a pattern is to be reproduced in which triangles abound, their bases looking towards the end at which the weaving begins, their apices towards the far end. [The mass of triangles shown in the centre of Part B of Plate XII would also apply in this case.] On counting the threads in the sample, the foreman discovers that the base of such a triangle is say one inch wide and spreads over say ten warp threads. Further, he counts how many times dyed yarn has been passed between the base and tip of each triangle. Let the number be ten and let the distance be again one inch. Clearly the warp threads are laid at the rate of ten to an inch, which also represents the closeness of the weft. It is obvious that, if in reproducing the carpet the foreman uses warp thread thicker than in the pattern, he must put in fewer threads side by side in the inch. Say he puts in 7: then the first row of weft embraces 7 warp threads, the next row 6, the next 5, then 4, 3, 2, 1, 1, 1, 1. Hence after passing the weft six times he reaches the tip of

the triangle. But he has reached it three rows too soon, and to add the deficient rows would give a finer point to the triangle than is warranted. Therefore if his warp thread is made a trifle too thickly, he must remedy the fault by making the weft a trifle broader. He thus equalizes the relation between warp and weft, though in so doing he puts in coarser work than he intended. This knowledge of how to balance warp and weft is the last thing a worker must learn before being placed as an overseer in charge of others.

As a matter of fact such knowledge is acquired in jails by a few naturally clever workers who have an 'eye' for design. It is when an overseer lacking this faculty, or possessing it in an imperfect manner, attempts to reproduce carpets that the grievous faults referred to by Mr. Burns occur. In practice the safest way to reproduce a carpet in altered relative dimensions is to reproduce it on squared paper.

The training of the pile carpet weaver proceeds on similar lines, though for such work far nimbler fingers and a keen eye for colour are essential.

From these remarks the reader will have arrived at the correct conclusion that the finer and more delicate the pattern the thinner and more closely set must be the warp and weft threads. Obviously it would be possible to embroider on a piece of fine muslin gauze, for example the green lino used for butterfly nets, a more delicate design than could ever be worked out on say a piece of wire netting of two-inch mesh. The same principle holds good in all textile work.

To train a convict up to moderate proficiency takes about six months, while about two years are needed before he will be able to make, if ever he can, a *dari* such as is represented on Plate XXVII. *Galicha*-making requires more natural talent than *dari*-making, and while many workers will have acquired in two years a nimbleness of hand and a correctness in colour appreciation which four years will not greatly improve, there are others with an eye for design which most never acquire at all. It may be said that all of the convicts at Yeraoda who have risen to the dignity of having carpets made entirely under their guidance have been men who *ab initio* have had a talent for drawing and designing.

On the usefulness of Instruction in Drawing.—To put in the correct colours, if a sample or a paper design is at hand, is merely a matter of careful supervision, but to make up a new design as the work proceeds is practically never done. The changing of the relative dimensions of a carpet is carried out by recasting the design either on squared paper, on plain paper, or on any smooth surface. The writer has frequently seen convicts making rough sketches worked out according to their own ideas prior to starting a carpet in changed relative dimensions. Had these men ever been taught drawing, their labours would have been greatly lightened.

Profits and Expenses.—A few remarks as to expenses and profits might be of interest. The writer has not succeeded in collecting any information regarding these matters among the free population, though certain general results all point in one direction.

The well-nigh universal complaint against carpets is their high price. For the Hyderabad Central Prison, the following figures give approximately what would be the daily wages of the workers if they were paid for their labour. With regard to the cheaper grades of *dari* selling at two and a half annas a square foot, each weaver would earn in an eight-hour day about four annas a day. For *daris* of narrow dimension capable of manufacture by a fly-shuttle loom, and therefore, from the point of view of construction, clothing rather than carpets, six annas a day would be earned by a rapid worker; *daris* of a simple flowery design selling at four annas a square foot would bring in three and a half annas a day; while the superior class of *dari* costing eight annas would fetch for the labourer a trifle less. Hence the simpler the style and the greater the task, the higher the remuneration. With regard to pile carpets, from three and a half to four annas a day are the limits within which the free worker would earn wages. If fifty per cent. be added to these amounts for a free labourer's working day of twelve hours, it will be seen that the remuneration is but poor. Moreover, if these amounts were paid to convict workers in addition to the actual expenses incurred, there would be no margin left of profit for the owners of the factory, nor any provision made for the payment of supervision, buildings, plant, or repairs. Hence in a free labour factory either the wage-earners would draw much less or the hours would be much longer, or the working expenses be much lower than in jails if the factory is to prosper or even remain in existence. Generally speaking, a *dari* or *galicha* sold in a jail for Rs. 100 costs Rs. 66 in raw materials and dyeing, while the odd Rs. 34 if spread out among so many workers labouring for so many days only yields the poor returns mentioned. This is not all. There are in every jail carpet factory many older feeble men engaged in the light subsidiary branches of the work, for example in winding up balls of thread, preparing the coloured wools into little sheaves, and so on. The wages earned by such each day are almost *nil*, but in a free factory their work would have to be paid for.

The writer once made a rough computation as to what should be the charge for a single square foot of pile carpet assuming that everything was to be of the highest order of excellence, that the labourers were to get a wage commensurate with the high skill they would have to display, that for such high class work at least one trained designer would be employed, that the proprietor was to get a profit such as would justify a continuance of the factory, and that lastly the purchaser should get good value for his money. The rate worked out at what seems to be the very high figure of Rs. 3-8 for a square foot, or two guineas a square yard. Such a carpet eighteen feet in each direction would cost 72 guineas and would contain about one and a half million stitches. After all this is only a reasonable price for what would be a real work of art. Obviously no industry in such fabrics could be maintained except among a community of millionaires. The public generally regards the old jail rate of a rupee a square foot as reasonable and Rs. 2 as high, while Rs. 2-8 it is said will find no purchaser. The latter price will however probably be the standard jail rate for pile carpets, for a smaller charge gives insufficient returns and would render the jails open to the charge that they are not properly adding the cost of labour in the bill.

CHAPTER VII.

Designs.

Many purchasers of carpets, and possibly many others also, regard the subject of design as the most interesting of all questions connected with carpets. In fact this tendency is rather overdone and many a carpet is bought at a high price—a taking design drawing attention away from defective colouring, or more frequently from general want of finish. Still it must be acknowledged that a positively bad design can never be compensated by the very best of dyeing or weaving.

To talk about designs in Indian carpets, and *à fortiori* in carpets made in this Presidency, as a distinct entity, is a mistake, for nowadays, thanks to the recent booming of the carpet trade and to free communication with places hitherto isolated, designs have altogether ceased to have any local significance. Only certain main features can be here and there recognised, often unfortunately appearing in incorrect conjunction in the same carpet.

The reader is particularly advised to procure, before proceeding with this chapter, Vol. XI, Nos. 89—94, of the 'Journal of Indian Art and Industry,' published in April 1906. In the 100 plates therein will be found most of the styles now current in India. The illustrations in this Monograph to some extent supplement these plates and refer of course to fabrics made in this Presidency. Unfortunately on grounds of expense the illustrations prepared specially for this volume cannot all be published, and not a few are, at the time of writing, still unfinished. If possible such will be dealt with in an addendum.

No one quite ignorant of Persian carpets can properly appreciate the designs generally met with in this Presidency. Frequent reference will therefore be made to Persian carpets.

It will be convenient to run briefly through the plates in the Journal first.

The frontispiece represents the carpet made in Akbar's Imperial Factory in or about 1634. There will be noted the following points: (*1*) The borders are seven in number, if counted in the usual manner. Of these the central or *bara motra* is by far the most conspicuous. The three inner and three outer borders are reduced to the dimensions of mere strips and are at times referred to as the inner and outer guard stripes.[1] (*2*) Of the three outer, the central or No. 2 is wider than 1 or 3, and in this particular pattern shows the design often referred to as 'the reciprocal trefoil,' a term which explains itself. Of this form of design there are many modifications which in the plates will be noted as they are met with. This style of design is by no means restricted to carpets. For example, it often adorns the tops of walls around mosques. (*3*) Border No. 6, corresponding on the inner side with the 'trefoil' on the outer, shows the well-known 'Persian vine' border,

a design subject to every variety of modification. In this case it is comparatively simple. As to the main border itself, the chief characteristic is the series of approximately circular figures having the appearance of clusters of opening buds on a common flower stalk. From these emerge branches which give off entwining leaves so arranged that there results a complete tangle which is not in any way symmetrical and which nevertheless shows a certain regularity in all its parts. These inflorescences vary in their colourings in a way which is characteristic though very hard to describe. Although for example Fig. 2 from the right hand is obviously identical, in design with the corresponding No. 2 from the left end, the colouring, while not being in different tints, is differently situated, for while the centre of the one may be red and the edges blue, in the other inflorescence this relation is reversed. The above is merely taken at random as an example of how colours are varied in these carpets. In fact one of the main features of old Persian carpets is the asymmetry both in design and colour. There is absolute harmony, with no machine-like regularity. The back-ground of the main border generally differs from that of the field. Frequently, as in this case, the ground of the field agrees in the main with the colouring of certain figures in the main border, particularly if these be numerous though of individually small dimensions. The small lac-coloured blossoms exemplify this point in the specimen under consideration. (*4*) Of the field itself it may be said that the five inset figures are quite unusual. The graceful curves which occupy most of the field are representative of some of the best Persian work and are in marked contrast with the native work of Asia Minor or Turkestan. It is surmised that it was work of this very style which the Persians learned from their Venetian instructors. Earlier Persian work was of a less ornate flowery style, though fully as intricate and delicate. To see the 'vine border' in a very fine form, the reader should turn to the last of the Journal plates, the famous Ardabil carpet. The same plate will show the extreme degree of elaboration to which old Persian carpets attained.

Plate 2 shows a design rarely seen on the Bombay side. It seems to be of modern design, possibly originating in Europe. The same remark applies to Plate 3. The guard stripes possibly represent a swaying 'vine border.' The trefoil appears at the innermost border. Plate 4, though not noticed in pile carpets, has been seen in a modified form as a *dari* among the Yeraoda samples.

No. 5 is the first of a series of designs never seen in this part of India. The border is most characteristic and is known as the 'Chinese Fret.' It is reminiscent of the ordinary key-border of the everyday *dari*. This series deals with Yarkand rugs; and if the reader turns to Plates 5, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, and 59, he will readily learn the main features which distinguish this class of carpet. The figure seen in Plate 21 at each end of each diamond is the *trisula*, while the 'Tree of Life' appears along the centre of the middle panel in No. 28. This and much other information can be found in the text which accompanies the plates.

Plate 6 represents a Mogul carpet, a type which the writer feels is exemplified in the Bombay Presidency by the famous Bijapur carpets. Plate 57, opposite page 434 in Watts' 'Art at Delhi,' shows these Bijapur carpets. The preceding plate in the same book showing a superb Bikaneer carpet exhibits a fabric of similar design. Plates 6, 13, 14, 47, 48, 49, 50, 54, 82, 83, 88, 89, 92, 94, and 96 represent designs which have much in common with the Akbar carpet in the frontispiece on the one hand and the Bijapur carpets on the other.

While at Yeraoda the compiler carefully examined the Bijapur patterns, not a few of which even down to minute details agreed with certain of the 'Mogul' and 'Jaipur' plates. The history of these designs would be interesting reading. Possibly the latest book on the subject, by Colonel Hendley, will have something to say on the subject. The Bijapur carpets by rumour came from Kashmir. The 'Kashmir' plates however show designs far less resembling Persian designs than do these Bijapur, Jaipur, and Mogul patterns.

Plate 7 introduces the reader to another figure, possibly the most ubiquitous of all in Persia-derived designs. In the field will be dimly discerned four looped or pear-shaped figures with the narrower ends lowermost and the 'stalks of the pear' pointing in alternate directions. Numerous indeed are the conjectures surrounding the origin and meaning of this figure. The most probable seems to be that it denotes the setting of jewels in the crown of Persia. This might account for its universal prevalence in old Persian carpets. By another account, the figure indicates the smudge which would be left after smearing ink or any blackish liquid on the inner edge of the hand, which thereupon was pressed down on the piece of cloth impressed with the figure. If such be the origin, the figure represents dye-stamping in a primitive form. The prevalence of the design would give colour to such a view of its origin though its preponderance in Persia would not be explained thereby. The figure appears in many textile fabrics, notably in Kashmir shawls. Another explanation offered is that the curve represents the river Jhelum as seen from the road into Kashmir. The prevalence of the figure in Kashmir products lends view to such a local explanation. Yet another explanation is that the figure if placed on its side bears some resemblance to, and is intended to represent, the small cruises of oil which in great numbers are lit along the walls and approaches to mosques during certain religious ceremonies.

And by way of recognition rather than of explanation, various terms have been applied to this figure. Many refer to it as a lamp, indicative of lamps hanging in mosques; others call it the Persian pear, a term which better than any other indicates its usual shape; others refer to it as a mango. It is probably the commonest of all figures on Persian carpets. Sind convicts refer to it as the 'parrot,' the pear-stalk corresponding with the bird's beak.

Plate 8 shows a design never met with in this Presidency. The vases in the field are somewhat reminiscent of the figures in old Kirman carpets. Possibly the design throughout is an Indian elaboration of the Kirmani.

Plate 9, a woollen pile carpet of the 16th century, introduces to the reader two other figures which abound in Persian designs. There will be noted in the

field groups of paired crescents with their concavities facing each other, an expanded flower intervening. The real meaning of this figure is open to almost as much doubt as the 'pear' already described. There is a figure often written about as the 'fish pattern,' and from some accounts it would seem that such is the figure now under discussion, the crescents denoting resting fishes. As a rule, each crescent is in two colours, dividing it into an inner and an outer segment. This division together with the serrated edges have suggested the idea of crumpled rose leaves. Whatever the meaning of the figure, till forty years back its presence in a carpet indicated where the fabric was made, and to this day such markings in the field are spoken of as 'Feraghan crescents.' But many a carpet made miles from Feraghan has such figures.

A very large number of the Yeraoda patterns show this mark. Among them is one having a deep cobalt blue ground. This fact, together with certain other features, induces the compiler to consider the sample as a portion of an old genuine Feraghan rug, now a thing of much rarity. The modern copies generally have a yellowish back-ground.

Plate 10 is interesting as showing (*a*) the reciprocal trefoil in each edge of the border, (*b*) the 'pear' in the main border, (*c*) the Feraghan crescent. It also shows, in common with the preceding plate, a diaper or lattice worked in among the figures of the field. This is coarsely effected in Plate 9; finely effected in Plate 10. This lattice arrangement introduces yet another type in Persian carpets. The style of carpet known as 'Sehna' may be taken as most illustrative of this form. In it a most delicate lattice permeates the entire field, throughout which Feraghan crescents very finely woven are interspersed with small representations of expanded flowers. The total effect is as if one were walking on a field of evenly scattered flowers, and that as one walked from spot to spot on the carpet, certain lines of the lattice became clear while others faded from conspicuous view.

Plate 15 shows a modern design, possibly from Europe, and not unlikely worked out in natural undyed wool as regards the field. Plates 15, 38, 40, and possibly 45 and 64, all show modern features. Such a design as 17, from the Royal Factory at Lahore, is rare in the extreme. There are certain fragments at Yeraoda which show grouped branches after the manner shown in this plate, though they are obviously poor copies from some old original.

Of the Kashmir designs such as appear on Plates 31, 41, 44, 58, 61, 65, 67, 79, 97, 98, and 99, the writer has seen no specimens in this Presidency. Obviously they range between two extremes—from the coarse massive Mirzapur style and the bold Southern India type to designs which approach in delicacy the finest Persian. Plates 32, 33, and 36 show how coarse Mirzapur carpets are apt to be. No. 34 is a good representation of a carpet brought in from Afghanistan. Plates however invariably fail to depict the real beauty of these fabrics. Nos. 51, 70, and 71 also show the same style of carpet. No. 39 depicts a very similar fabric from Baluchistan. Not a few of these carpets are now made within British India along the Upper Sind Frontier and by tribes who descend in the winter from the neighbourhood of Kelat. No. 42 shows

the large style adopted in certain Southern India carpets, while Plates 45, 52, 53, 66, 76, 77, represent work of a more delicate character from the same part of the peninsula. Plate 57 introduces yet one more common feature in Persian designs. In the border will be seen two 'pears' with their stems approximated and between them an elongated cone. A meaning is said to be attached to this cone, which is often treated with much greater elaboration than in the plate under consideration. Frequently it is utilized as a trunk, from which stiff Noah's-ark-like branches emerge, significant of the 'Tree of Life.' As shown in the plate, the entire border is strongly suggestive of a Khorassan carpet. A large number of the Yeraoda patterns have it in an accurate form and certain other jails also possess it.

Plate 69 is here referred to for it has the honour of being the only representative in the series of 100 of the Bombay Presidency. Presumably it is a product of the Thana Jail in its former days of glory, though at the present time the Jail only possesses a solitary copy of a Yeraoda design which in any way agrees with the plate under discussion. The Yeraoda sample is mentioned in Watts' 'Art at Delhi' and is there referred to as a 'Kirmani.' The writer however, after closely studying the matter during last year, is of opinion, with all deference, that the evidence in favour of the sample being a piece of old Sehna carpet is equally strong. But whatever its origin, the fragment is of exquisite workmanship, and copies from it were frequently ordered after the Delhi Exhibition. Mooltan carpets are noted for their long shaggy pile and for the general boldness of their design. The latter point can be seen in Plates 72 and 73. The celebrated Jaipur carpets, shown in colours, bear an obvious resemblance to the Bijapurs and old Moguls. Doubtless Colonel Hendley's new book will give a full account of their origin. The Lahore and Punjab carpets are obviously woven in designs of great beauty.

With the above cursory sketch of how most Indian carpets are designed the reader will be the better prepared for a scrutiny of such plates as the writer has been able to get together. Possibly certain plates will follow after the time of going to press; such will be added if deemed worthy of inclusion.

It will be more convenient to consider *daris* and *galichas* alike, noting *in passu* whether the design is better suited for one form or the other.

Plate XI shows how an idea can be usefully turned to account. The Superintendent at Shikarpur frequently lost samples in the post. He therefore had woven on a common warp small portions of *dari* in all the most-sought-after designs. The customer, on returning the *dari*, gave his orders pinned on the particular part of the field preferred. Many of the easily woven styles of *dari* are there shown. No special skill would be needed for such work. The *patti* at each end and the plaited fringes should be noted.

Plate XII is our real introduction to Bombay designs. The *dari* indicated by A is without a border and is in plain stripes. It represents therefore the simplest form of design. Such a *dari* if under six feet in width could be more economically made on a shuttle loom. A *jhorya* is such a *dari*, possibly

devoid of the simple stripes. A *gudhar* resembles this style of *dari*, except that it is generally woven in pieces about eleven inches wide. About five such strips would therefore have to be sewn along their edges to make a reasonably wide *dari.*

The part of the Fig. 2 marked B goes a stage farther. There, on three sides, a key-border, probably the simplest of all borders to make, is shown. The centre of the field calls for more training.

Plate XIII, Part A, shows a *dari* which calls for the next degree of skill. All the lines are straight and all run either parallel to the edges or exactly transversely. In another figure (Plate XXVIII) there will be seen a very common geometrical design mostly in straight lines. The broadest part of the border is occupied with what might be rectangular 'catherine wheels.' This figure is capable of endless elaboration without calling for a commensurate increase in skill on the part of the weaver. Such a form is reminiscent of the figure known as the *swastika*, the meaning of which is too deep a subject for discussion here. Suffice it to say that such a form of ornamentation is practically widespread over the world and seems to have been known from the earliest times.

The central figure in Plate XII, Part B, already referred to on page 58, indicates the next design to be mastered by the learner. This consists of a mass of triangles with their apices pointing to the mesial line of the figure. When once the weaver can put in these diagonal lines neatly he can go ahead.

Plate XIII would next be attempted by the learner as calling for simple colour manipulation. The small combinations and permutations which can be made use of in these *daris* is almost bewildering in their number. Those shown were selected mainly as being suited for photographic work.

Plate XIV shows the following: (*a*) a very common form of border, all worked out in straight lines; (*b*) the reciprocal trefoil, also entirely in straight lines.

Plate XV goes a stage farther. There will be noted three narrow stripes each showing a series of hooks. These are strictly rectangular or rounded according to the skill of the weaver. The same holds good regarding the broad panel on the edge remote from the fringe. This part of the field is of the same design as prevails in Baluch *farasis*. The hook referred to in its proper field is known as the 'Daghestan hook' or the 'latch-hook.' The small triangles along two edges are common in many *daris* and abound in many forms of weaving among hill tribes. This *dari* is a curious mixture of types. Probably the same would be found true of most *daris* if their origins could be worked out.

Plate XVI also shows a *dari* with a curious mixture of parts. Commencing from the fringe there is after the *patti* a thin stripe with diagonal markings.

American writers are very happy in their comparisons. For example the 'pear' previously referred to is an American comparison: the Daghestan loop was called by Americans the 'latch-hook,' a most apt description. This diagonal stripe under consideration is with equal aptness known as the 'barber's pole.' After the 'barber's pole' there is the double 'reciprocal trefoil,' in this case once more in straight lines, which however are all diagonals. Then inside there is the latch-hook, in this case with rather rounded angles. Along one side a key-border is substituted, an example of the regular irregularity of Eastern work. The writer makes no pretence to understand the meaning of the central figures or of those of the main border.

Of the remaining plates, Nos. XVII, XVIII, XIX, XX, XXI, XXII, XXIII, XXIV, XXV, and XXVI are usually made up as cotton *daris*, and so is No. XXVII. It will be noted that not a few of these are designs of much beauty and no little complexity. Where most of them came from, and whether the figures have any meaning, the compiler, in spite of prolonged enquiries, is quite unable to say. An incident will illustrate the complete jumbling up which has during recent years occurred among carpet designs. A representative of a large European house, visiting the factory recently, commented at random on the *daris* under construction. Of the various figures appearing in the designs, one he said should properly appear in the fabric known as a *kis-khilim*, a product of Northern India; in another were many figures found in Southern India carpets. How did these figures arise in the patterns at the Hyderabad Central Prison? The writer believes that not a few of the figures in the field of most of the Yeraoda *daris* originated in Southern India. Till recently, *daris* of vivid hue and very bold design were made at Hyderabad (Sind). The writer was surprised to discover lately when scanning the figures that not a few appeared in carpets made in certain parts of Trans-Caspiana. And many a carpet seen in India is of Asia Minor type!

Detailed reference to all the plates quoted is not necessary. No. XXI shows the Chinese Fret, while the squares in the inner border are suggestive of an ancient origin. But do the little branches indicate the 'Tree of Life'?

No. XXII is hybrid in design. In the centre the Persian 'pear,' then the 'barber's pole' (a Circassian feature), then an attenuated Persian 'vine,' followed by another 'pole.' What are the large figures in the main border? They might equally well come from Southern India or from Mesopotamia.

No. XXIII represents a very fine *dari*. The Daghestan 'latch-hook' is seen at the edge, the 'trefoil' is seen inside the border. The figures of the field and main border await explanation. Much in this *dari* suggests an origin outside India.

No. XXIV shows a design of which the origin awaits explanation. It is surmised to be Southern Indian. The *dari* is made at Yeraoda and Shikarpur.

No. XXV is probably a Hindu version of a prayer-carpet, made originally somewhere in Southern India, although the design is now at Yeraoda. Possibly

it was made originally by a convict there. The upper curve probably indicates the roof of a mosque and the lower curve the *mihrab*. The panels on each side are in a very ordinary style of *dari* design. The tree-like forms at the top of the central panel perhaps are Indian renderings of the 'Tree of Life.'

No. XXVI depicts a *dari* which is now frequently found in the Deccan. Throughout the Bombay jails it goes by the name of 'the Bijapur prayer-carpet,' perhaps because the design was woven at the Bijapur Jail from an early date in the prison's history. The illustration was taken from a cotton pile carpet made at Shikarpur, though it is not altogether a happy reproduction. By repute, surmounting the lamp which is represented above the roof of the mosque, there should be a small elliptical figure indicative of the 'Eye of Allah.' The lamp hanging lower down denotes the 'Lamp of Life.' What the four figures appearing as expanded flowers or the designs in the borders indicate is not known. By tradition the original design abounded in symbols, though the compiler, after prolonged enquiries, has not been able to confirm such tradition in the very least. The cusps in the arch should be more angular—the curved cusps being a Hindu modification. A comb-like figure is also missing. It was inserted, it is said, in the original design to remind the devout Musalman that the hair and beard must be kept well trimmed.

Plate XXVII represents the high-water mark of excellence in *daris*, which since the Delhi Exhibition has attained no little notoriety in Western India as one of the finest products of the Yeraoda factory. It is also shown in Plate 60 facing page 446 of Watts' 'Art at Delhi.' The back-ground is a fine *manjit*, that is, a reddish brown; and the better the shade obtained in the dye shed for this ground, the finer the general effect. An indifferent back-ground altogether spoils the *dari*. The back-ground of the larger lozenge-shaped figures with sinuous margins is a rich blue, while the smaller rectangles with clipped corners are in varying shades of reds, browns, yellows, and blues.

The border presents the latch-hook at the outer edge, a series of double crosses at the next row, then a characteristic palisade-like wavy line. This may indicate a crude rectilinear mode of indicating a 'vine' border. In Persian carpets a similar figure is held to represent running water. The small figures like blocks from a child's box of wooden bricks indicate probably only an easy way of filling in the gaps formed by the 'palisade.' It is not at all unlikely that most of the small figures in the field and borders are similarly only means of filling up inconvenient gaps.

A considerable amount of asymmetry is a sign of correct work in these *daris*. This asymmetry is seen in two ways best indicated by examples. As shown in the plate, the innermost edge of the border parallel to the bottom of the page shows a 'trefoil.' The corresponding part of the border along the right side differs in showing a series of triangles and of dots. If this row of triangles be scrutinized, it will be seen that the first fourteen or fifteen teeth are larger than the rest: further, the transition from the larger teeth to the smaller is abrupt and awkward. This then constitutes the second class of asymmetry. And everywhere throughout the field, excepting with regard to

the location of the larger masses, irregularity and inequality seem to be the rule rather than the exception. The explanation may be as follows. These designs, whatever their actual origin, are of no recent date. Formerly the worker evolved his pattern, at least as regards the smaller figures, as he proceeded. The irregularities were possibly indicative of where he finished work one day and resumed it on the morrow, or denote some passing fancy which he in a dreamy way attempted to express in design. It is absolutely hopeless for the average European to even guess at what the Oriental can do as the outcome of habitual mental abstraction. Nowadays not even the Oriental can guess at what his ancestor had passing through his mind during such moments.

The *dari* under consideration needs for its skilful production able hands, and not one convict in fifty in the *dari* shed is ever capable of such work.

Before leaving this *dari* the illustration shows another example of asymmetry. If the eye be run along the right edge of the field about one-half inch inside the tips of the triangles referred to, it will cross approximately the bases of seven and a half figures, of which two, or possibly three, obviously fall out of the general straight line. This asymmetry is a certain sign that the *dari* is hand-made and indicates a high probability of Eastern origin. It is true that faulty workmanship might be alleged as the true explanation, although with capable workers these irregularities should not be amended.

All the figures previously referred to among the illustrations in this volume deal with designs usually made up as *daris*, though there is not one of them which cannot be made as a *galicha*. Of those about to be described, the converse holds true. In two however a special form of weaving is usual.

Plate XXVIII shows a design which was obtained from a very old original, made possibly in one of the older jails in the fifties or sixties. The central field was copied from a still older Persian, a form of Persian carpet known as 'Shiraz,' now made in free labour factories in the crudest manner and sold in enormous numbers; but the catherine-wheel-like figures denote a jail reproduction. Several of these have been carefully copied at the Hyderabad Prison in wool, and woven like a *dari*. The general effect when thus prepared is very pleasing.

Plate XXIX also hails from Hyderabad (Sind) though its home is between Pad-Idan and the Khairpur Territory. In fact the writer is assured that more come from the Khairpur State than from elsewhere. This design is known throughout Sind, where it is very common, as 'Chiapat,' and is made in hair or wool after the manner of a *dari*. When well dyed with a lac back-ground, it is far superior to many of the cheaper Amritsar or 'Gulf' products.

Plate XXX is from Shikarpur and shows a small carpet with a good Persian border and an elaborate treatment of the 'pear' or 'mango' as it is called in Shikarpur. The local jail possesses several patterns in which this figure is much elaborated.

Plate XXXIII is from a carpet nearly eighty years old lent by a Hyderabad gentleman in whose family are many carpets of real merit. The same gentleman loaned to the writer the finest specimen of a Baluch rug he has seen.

Unfortunately the colours were quite unsuited for photography. Plate 58-A in Watts' 'Art at Delhi' will give some idea of this kind of rug. Whether it was made in parts now within British India is not clear. Fig. 33 is a good example of a Persian design remarkably free from over-elaboration.

Plate XXXIV shows a Baluch *farasi.* The ground is a rich lac, the lighter figures are in white, several of the transverse bars are in green. It is this style of fabric which is woven by continuing the threads unbroken along the under-surface to whatever place calls for the re-appearance of the colour in the design.

These *farasis* if in large size (18 feet by 18 feet) make excellent floor coverings for dining rooms equally suitable for India and Europe, though for the latter a smaller size would suffice. They can only be made by men from Upper Sind or Baluchistan. Consequently they can only be had by free labour in Sind or from the Sind jails.

Plate XXXV introduces another style of design generally made at Yeraoda in natural colours. By this is meant that none of the wool used ever enters the dye-shed, but that after cleansing, the different shades of brown, grey, black, yellow, buff, and so on, are carefully, indeed very carefully, picked out, and from these the design is worked out. It need hardly be added that a very appreciative colour-sense is needed for this work. Inasmuch as a large consignment of wool will often fail to yield half of what is needed in certain unusual tints, it follows that even a small rug calls for an enormous expenditure in wool, the unused parts of which however can be utilized in other fabrics. In consequence the 'natural wool' carpets are as costly as any, but their beauty is very great, while fading of colour is of course out of the question. They were very favourably commented on at the Delhi Exhibition. The design in Fig. 33 is typical of many others used in these undyed carpets. A field abounding in thin wavy lines is best suited for this work.

Plate XLI illustrates the high-water mark of excellence in the Yeraoda pile carpets. There are at Yeraoda in all sixteen designs, of which No. 41 is only one taken at random and not necessarily the best. As a matter of fact, there are some three or four others better. The specimen shown was selected as well suited for coloured illustration. It might be added that, for this Monograph, at great expense and infinite trouble, the Photozincographic Office at Poona is attempting for the first time work which taxes to the utmost many of the best firms in England.

These sixteen designs collectively constitute the 'Bijapur carpets' which, in the opinion of Sir George Watt and other authorities, have had such an excellent effect on carpets in Western India. He writes:—

"It would thus appear that the Poona Jail has been the means of distributing some admirable carpets all over Western India that could not otherwise have been secured. And what is more, it is largely due to the circumstance of the Bijapur carpets having been lined, when they were sent to Yeraoda to be copied, that they are in the state of preservation they are now in. Instead of the Yeraoda Jail having exercised

a debasing influence on the carpet manufactures of Western India, it has absolutely conservated what might otherwise have been lost."

There is no need to dilate here upon the obvious beauty of these designs nor upon the very close resemblance which they bear to the figures designated 'Jaipur,' 'Mogul,' 'Lahore,' 'Punjab,' 'Kashmir,' in other plates. That they are mainly Persian in conception there can be no doubt, though there will not be seen the 'pear,' the 'Feraghan crescent,' the 'lattice,' the 'barber's pole,' the 'latch hook,' nor many things which enter more or less correctly into so many forms of Persian design appearing among these ornate floral reproductions. Though the student study any text-book on Persian carpets he will assuredly learn nothing very clear and definite about designs, but he will at least recognize that there are two general classes, if not three. The ordinary 'pear,' or 'lattice,' or 'crescent,' represents an old style, now reproduced in enormous numbers but not sought after by Europeans. Another class is characterized by a field studded with minute flowers so that no conspicuous figures obtrude on the sense of smoothness. Of this class the 'Sehna' style, now rarely seen, is typical, while the third remains in India as this style now under consideration, known around Agra as 'Mogul,' in Rajputana as 'Jaipur,' in this Presidency as 'Bijapur.' By conjecture these Bijapur carpets came originally from Kashmir, and it is not unlikely that all the Indian manifestations of this form of Persian design came through that country. There is a style known as 'Mina Khani' in Persian designs which is often copied where trained designers are available. It is a Persian design characterized by a profusion of entwining branches which surround medallion-like figures. This style is evidently allied to the 'floral' type of Indian carpets. The Ardebil carpet represented on the last plate in the Art Journal series is another superb example of a floral style of design. The writer conjectures that this is the style of work which the Venetian artists sent for by Abbas the Second taught in Persia.

The remaining five plates, Nos. XLIII—XLVII inclusive, are of interest as emanating from the Ali Murad School of Art at Khairpur. The writer saw all these carpets and many others during a most interesting visit. The first two were made by reproducing on squared paper designs in full size plates, and show very well what correct work can be done. As mentioned elsewhere, the dyeing alone was bad, the design and weaving being excellent.

The field of XLIII seems to be either purely Occidental or a Westernized adaptation of an Eastern pattern.

Plate XLIV refers to a carpet which was really excellently made. The entire field has been woven with admirable correctness and the details are very clear. Here can be well seen the 'lattice' previously mentioned, and less readily will be discerned the 'Feraghan crescents,' each pair enveloping on two sides an expanded flower. Sehna carpets often show this field, though the characteristics of a Sehna carpet are not the actual figures which enter into the field, but the exceeding intricacy in which those figures repeat themselves. The field seems everywhere the same, whereas in detail it is ever changing.

Plate XLV refers to a carpet in silk pile originally intended as a royal present. As a work of art it deserves all praise, though without doubt it contains far too much yellow to be wholly pleasing. The teacher who guided the weavers through this work hailed from the Punjab, and as the making of a silk carpet in this Presidency is quite a rare event, this fabric, excellent though it is, calls for no further remark.

[ADDENDUM.—Certain plates, namely, Nos. XXXI, XXXII, XXXVI to XL inclusive, were received late. No. XXXI shows carpets from Shikarpur, the others are from Thana.]

PLATE XI.

Cotton Dari—Shikarpur.

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A cotton *dari* designed to show in one fabric most of the common patterns.
See page 65.

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PLATE XII.

Cotton Daris from Yeraoda.

A—A borderless *dari*.

key border......

key border......

B—Showing mass of triangles in centre, see page 58.

PLATE XIII.

Cotton Daris.

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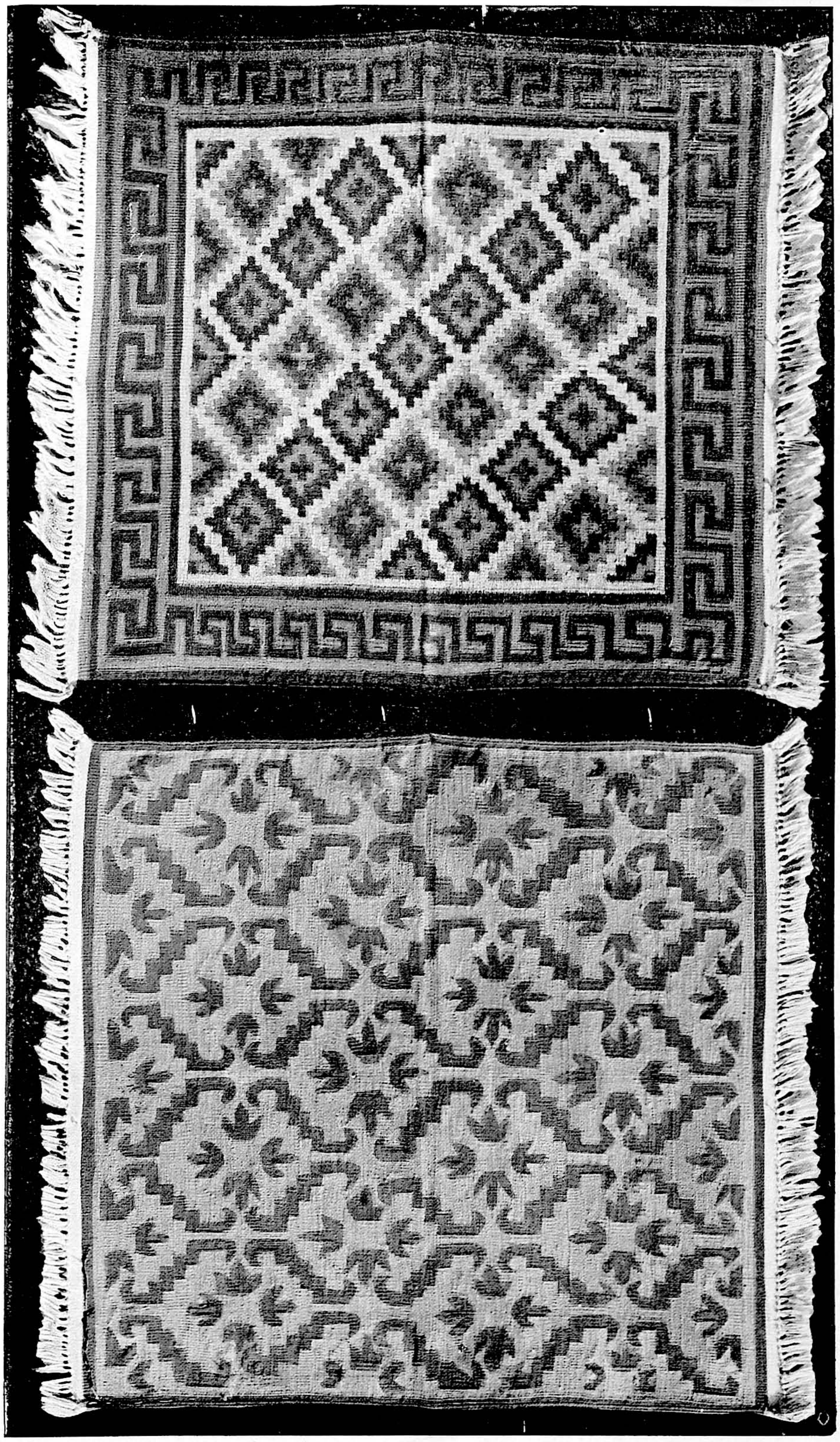
A



B

Of these the upper being more regular, is the easier to make.

PLATE XIV.

Cotton Dari—Yeraoda.

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reciprocal trefoil.

PLATE XV.

Cotton Dari—Yeraoda, possibly from Shikarpur.

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......a broad *patti*.

.. ..' latch-hook.'

.....' latch-hook.'

........as seen in Baluch *daris*

[See description on page 66.]

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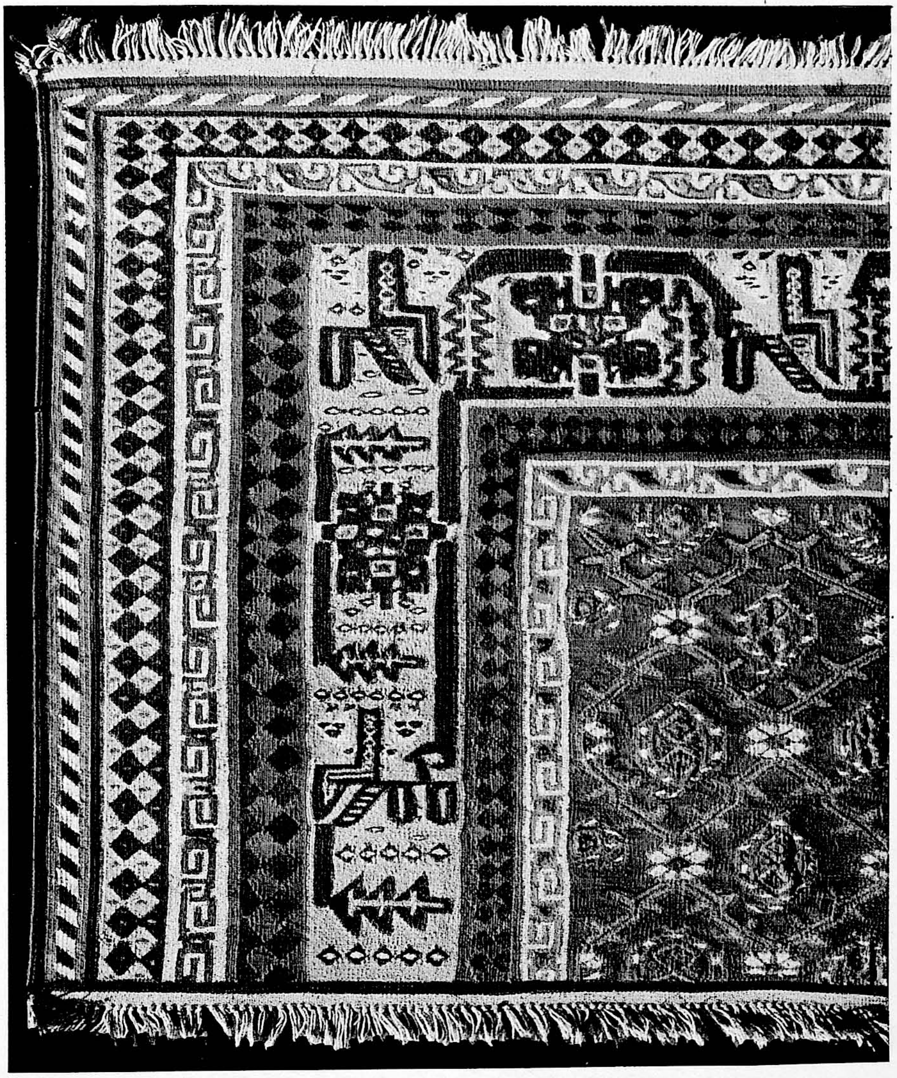
PLATE XVI.

An interesting Cotton Dari—Yeraoda.



[See page 66.]

PLATE XVII.

Cotton Dari—Yeraoda.

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PLATE XVIII.

Cotton Dari—Yeraoda.

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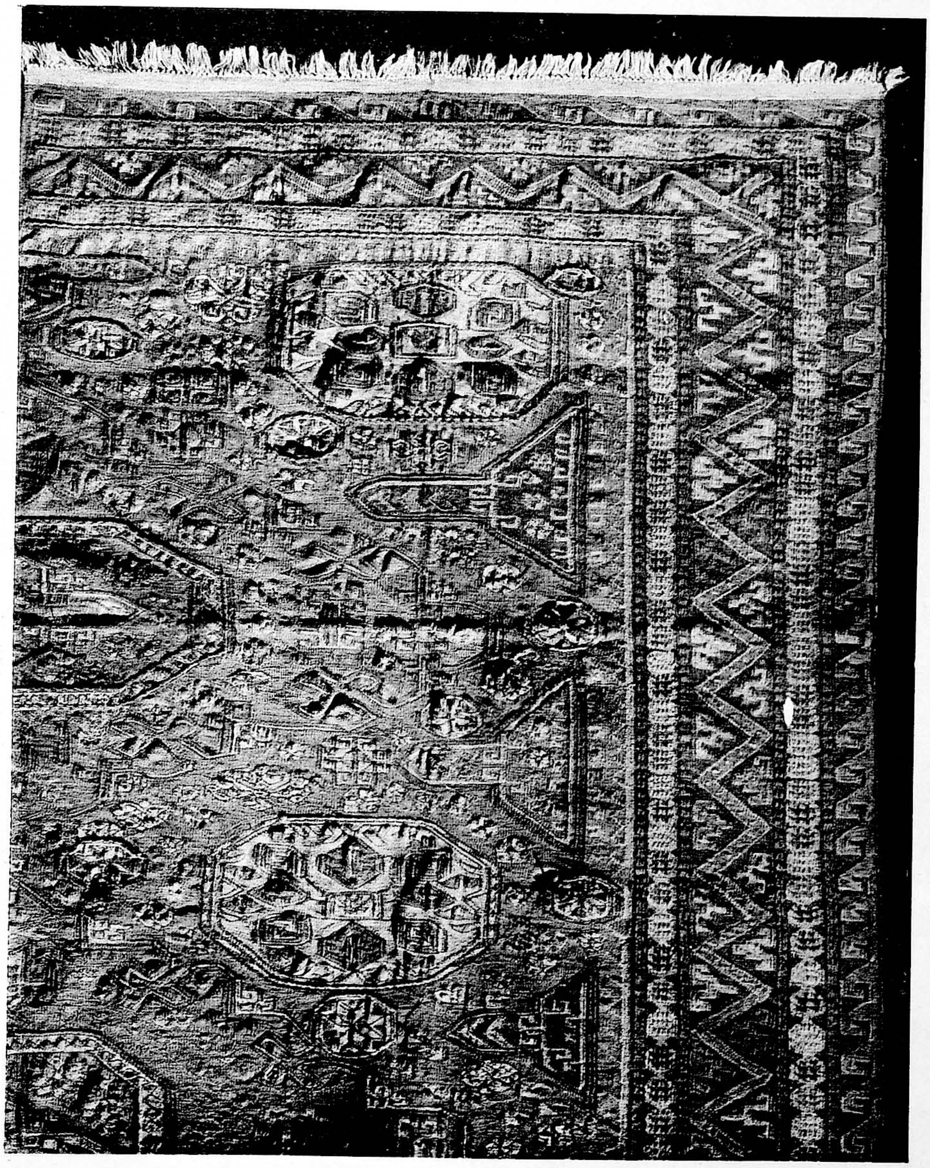
PLATE XIX.

Cotton Dari—Yeraoda.



The Daghestan 'latch-hook' along the right side is well seen.

PLATE XX.

Cotton Dari—Yeraoda.

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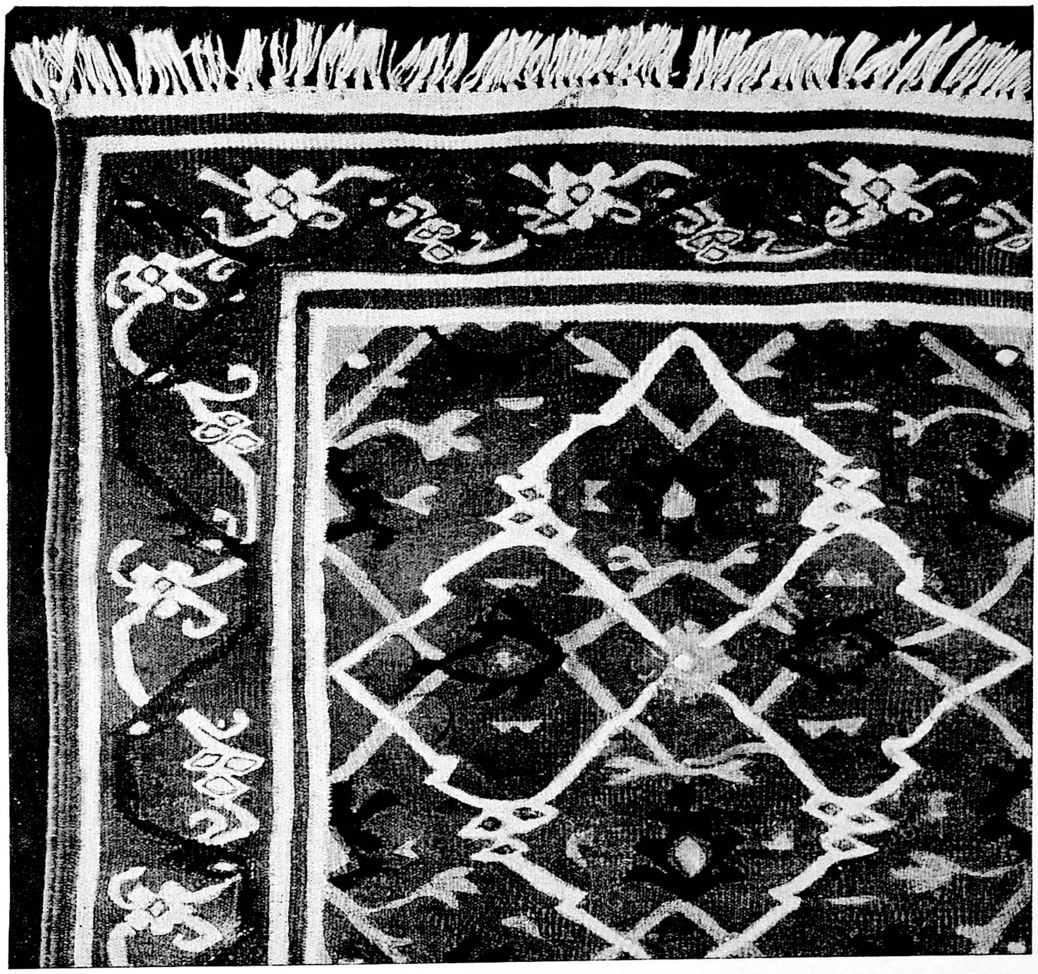

PLATE XXI.

Cotton Dari—Yeraoda.

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......Chinese fret.

...... ? Tree of Life.

PLATE XXII.

Cotton Dari—Yeraoda.

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......'barber's po le.'

'pears'.........

PLATE XXIII.

Cotton Dari—Yeraoda.

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PLATE XXIV.

Cotton Dari—Shikarpur.

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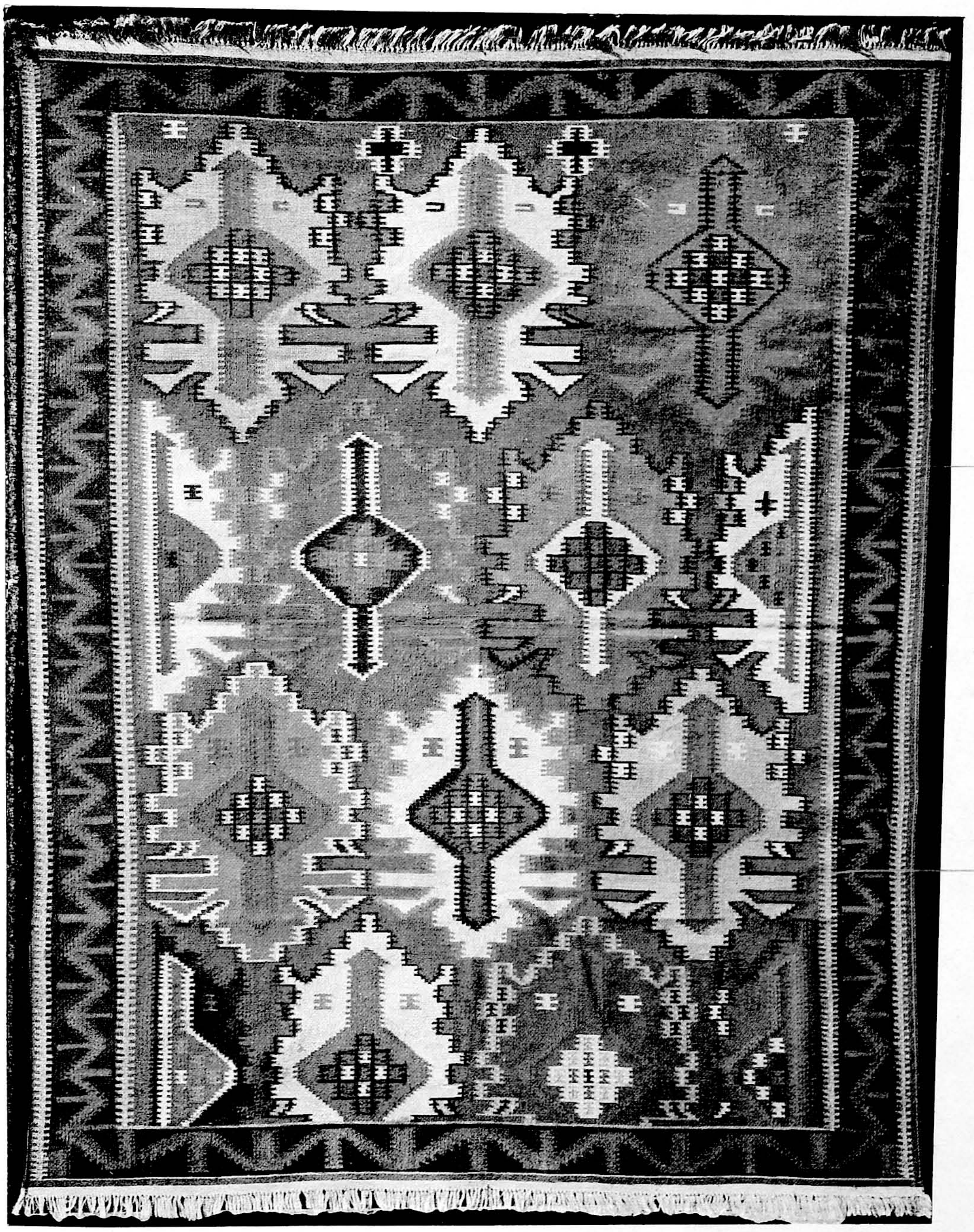

This very curious design comes from Shikarpur.

PLATE XXV.

Cotton Dari—Shikarpur.

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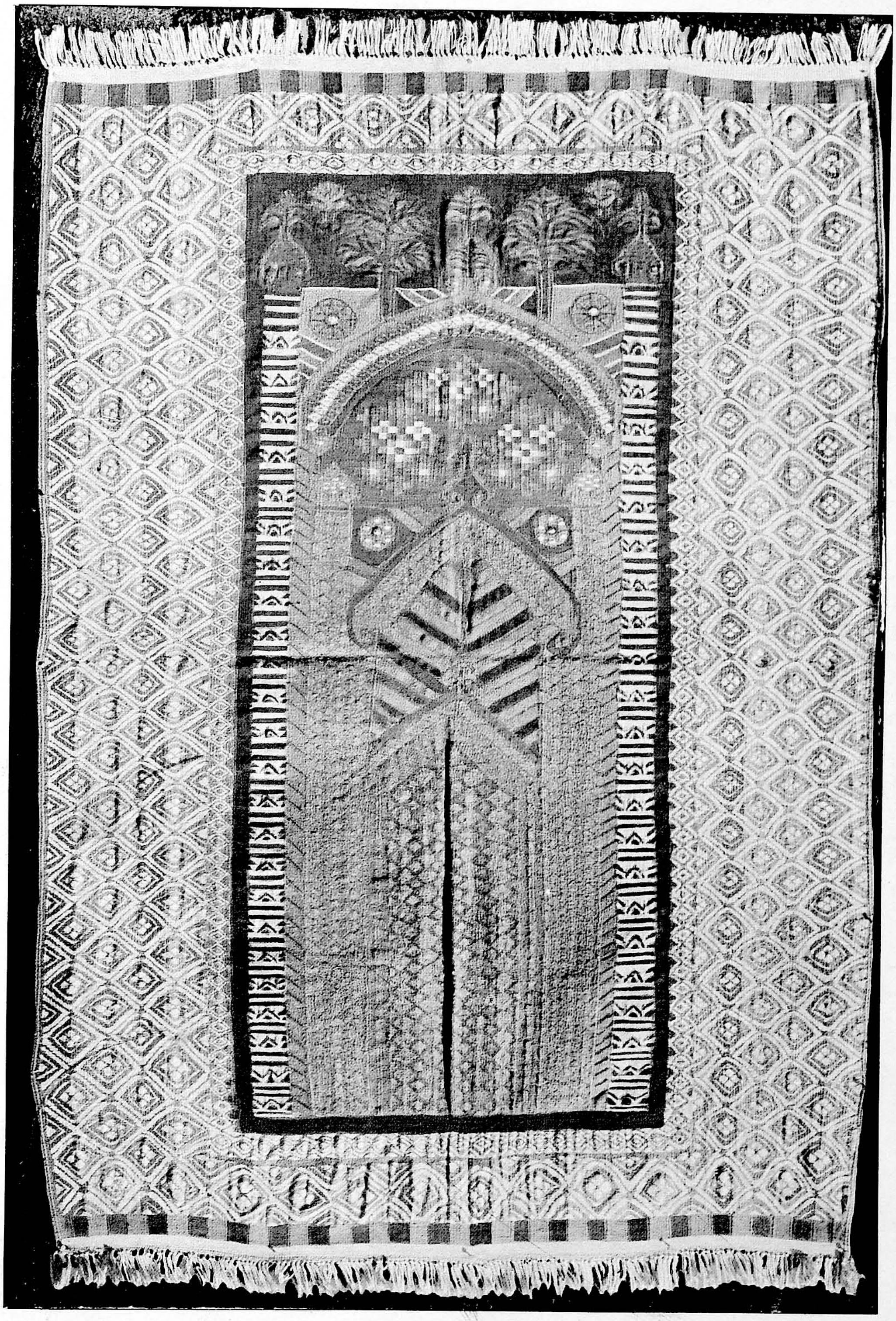

The central portion represents the arched entrance to a mosque.

PLATE XXVI.

Cotton Dari—Shikarpur.

Commonly known as the 'Bijapur Prayer Carpet' and not to be confounded with any of the Bijapur pile carpets. From a copy made at Shikarpur where these are often produced in cotton pile. See page 68.

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PLATE XXVII.

Cotton Dari—Yeraoda.

The colouring of this *dari* is very effective. See page 68.

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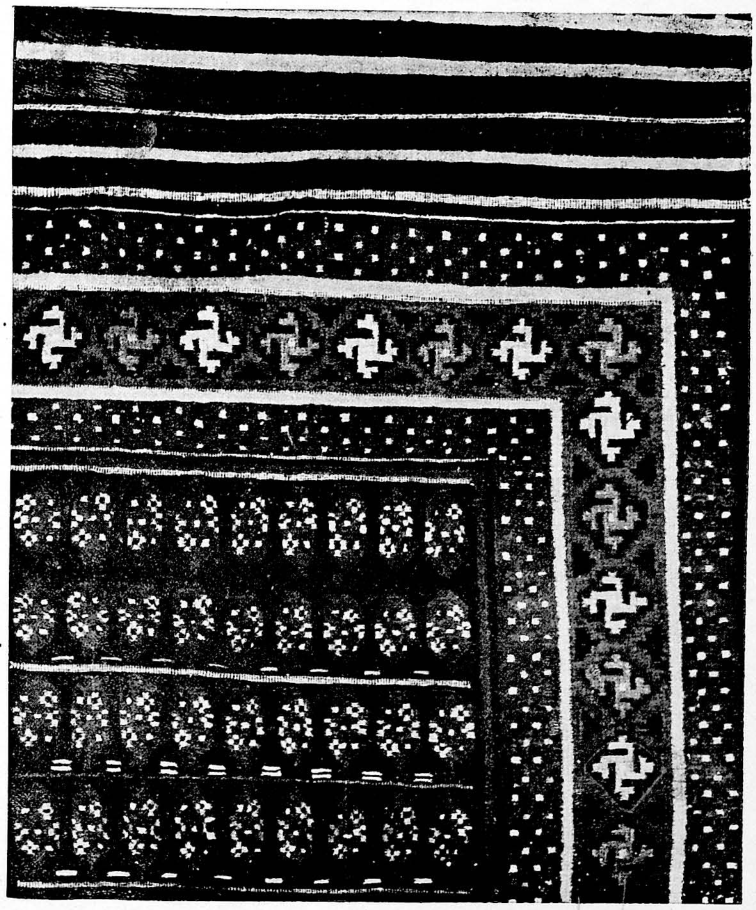
PLATE XXVIII.

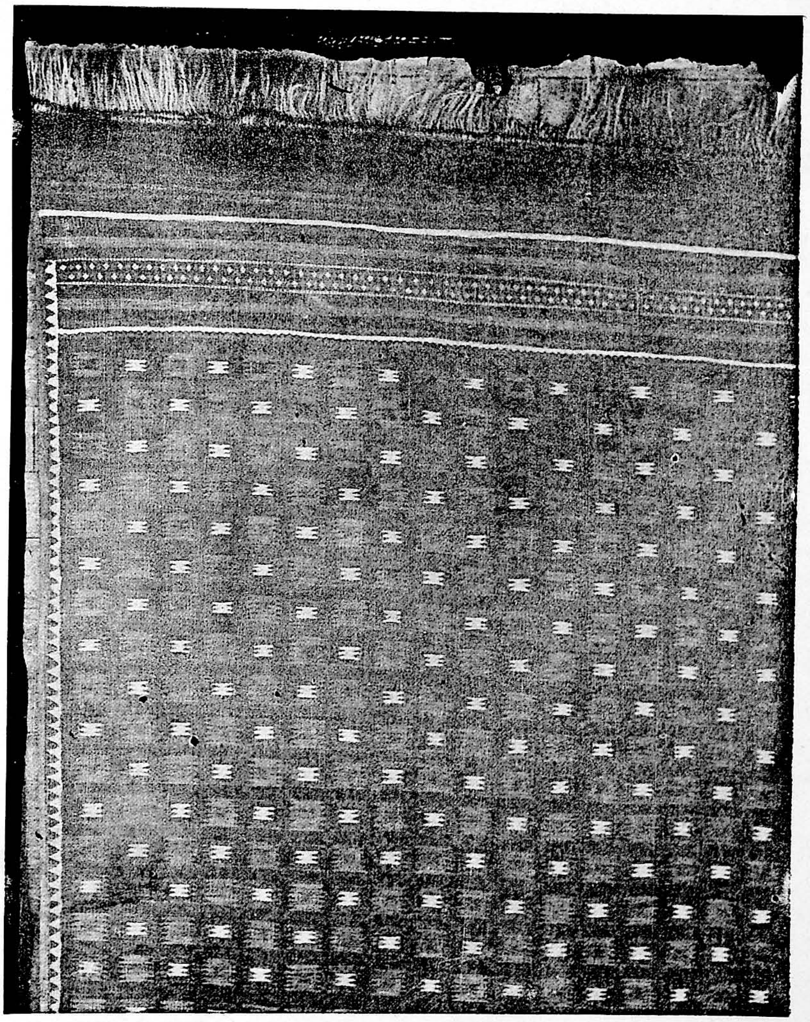
Dari woven in wool—Hyderabad (Sind).



This illustration fails to show several characteristic points.

PLATE XXIX.

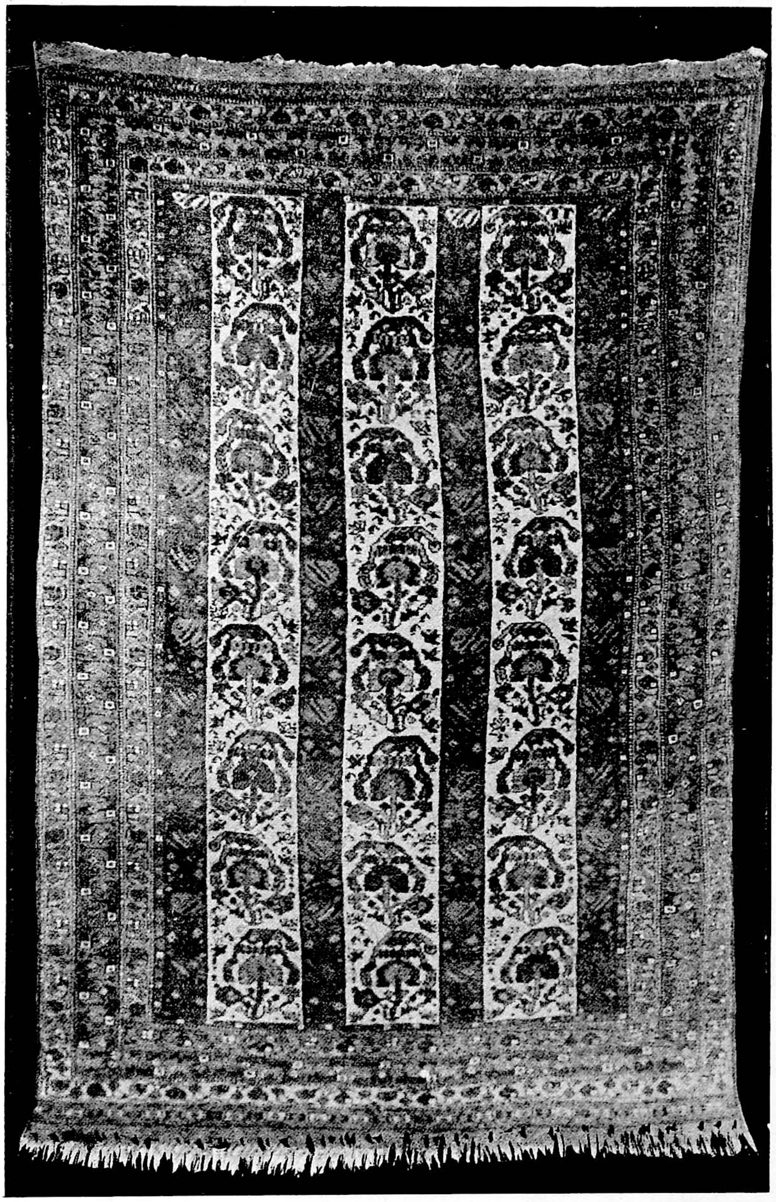
The woollen Dari known in Sind as 'Chiapat'—Hyderabad (Sind).



[See page 69.]

PLATE XXX.

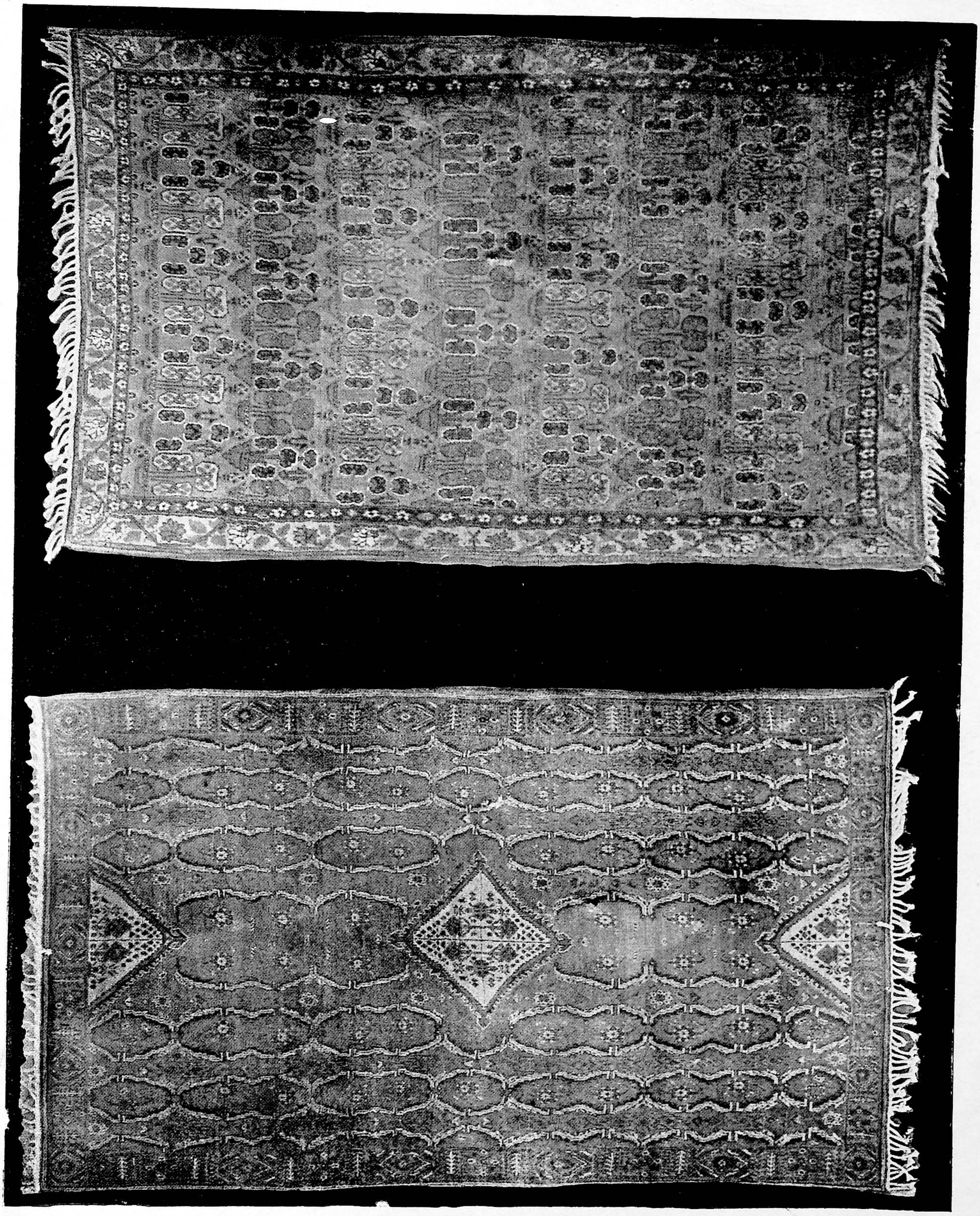
Woollen Pile Carpet—Shikarpur.



The 'mango' or 'pear' (see page 63) is in this design considerably elaborated.

PLATE XXXI.

Woollen Pile Carpets—Shikarpur.



These very curious designs are known in Shikarpur as 'Turkoman,' though such a designation is probably inaccurate.

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PLATE XXXII.

Woollen Pile Carpet—Yeroada, Shikarpur, Hyderabad (Sind), and elsewhere.

An excellent illustration of a modern Shiraz style. The diagonally striped line known as the 'barber's pole' and the 'pear' are well depicted.

PLATE XXXIII.

Woollen Pile Carpet about eighty years old—Hyderabad (Sind).

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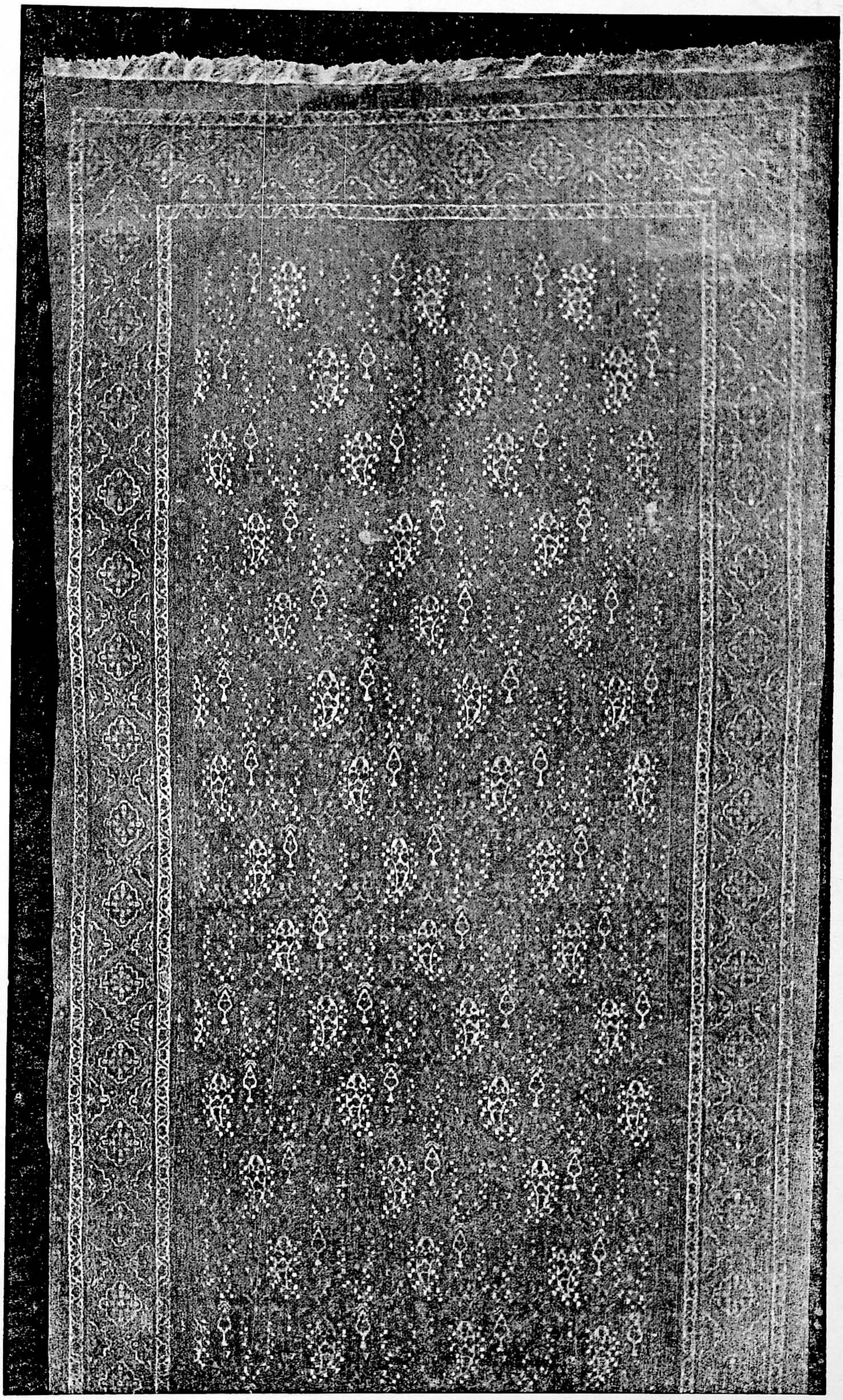
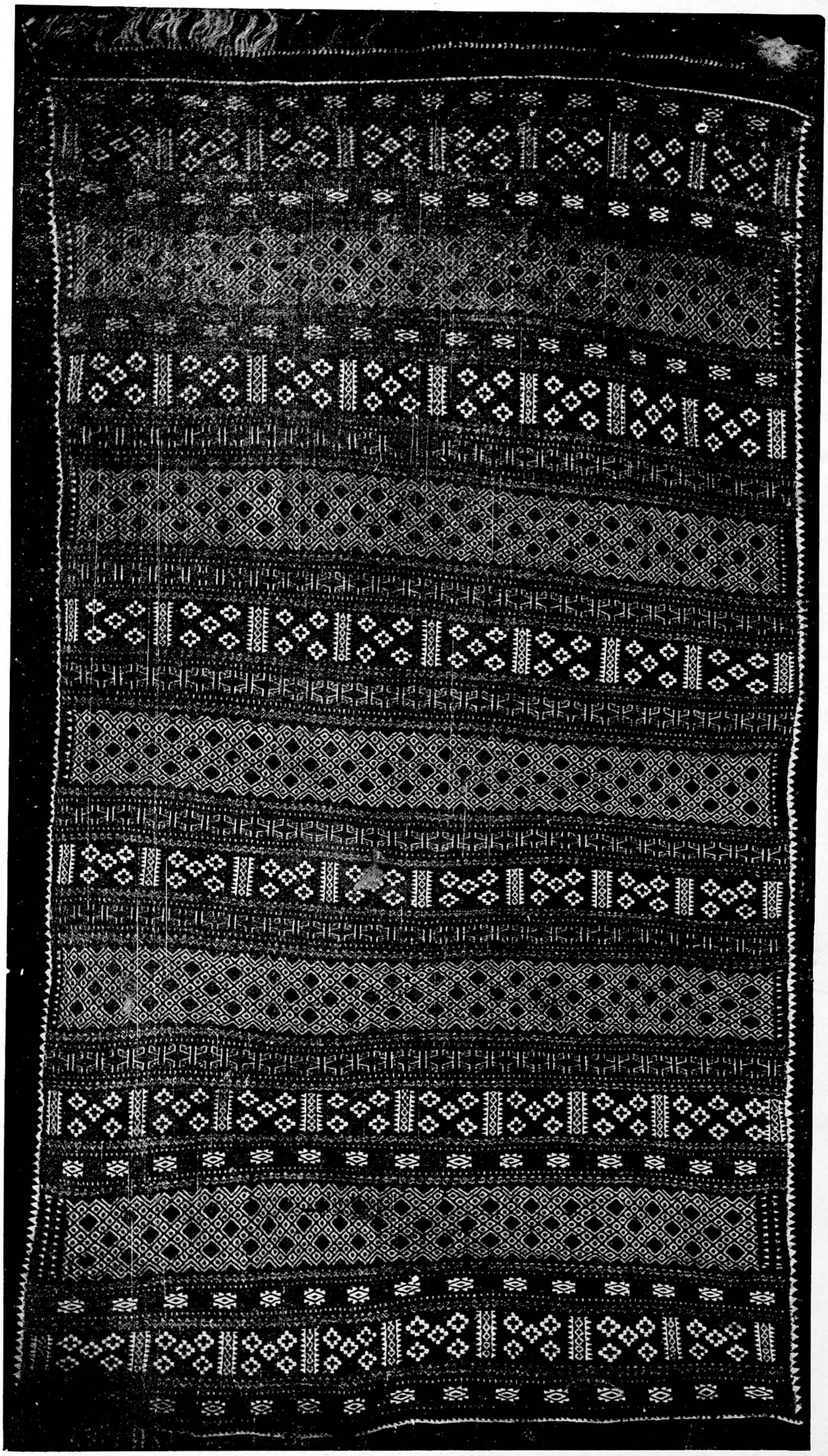


PLATE XXXIV.

Woollen Dari or Farasi—Hyderabad (Sind).



This style of carpet is known as the 'Baluch' pattern, and when well made is much sought after. See page 70.

PLATE XXXV.

Woollen Pile Carpet—Yeraoda.

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Designs similar to that shown are well suited for the manufacture of 'natural wool' carpets, which are a special feature of the Yeraoda factory. Designs such as appear on Plates XLI and XLII are also suited for 'natural wool' work.

PLATE XXXVI.

Woollen Pile Carpet—Thana.

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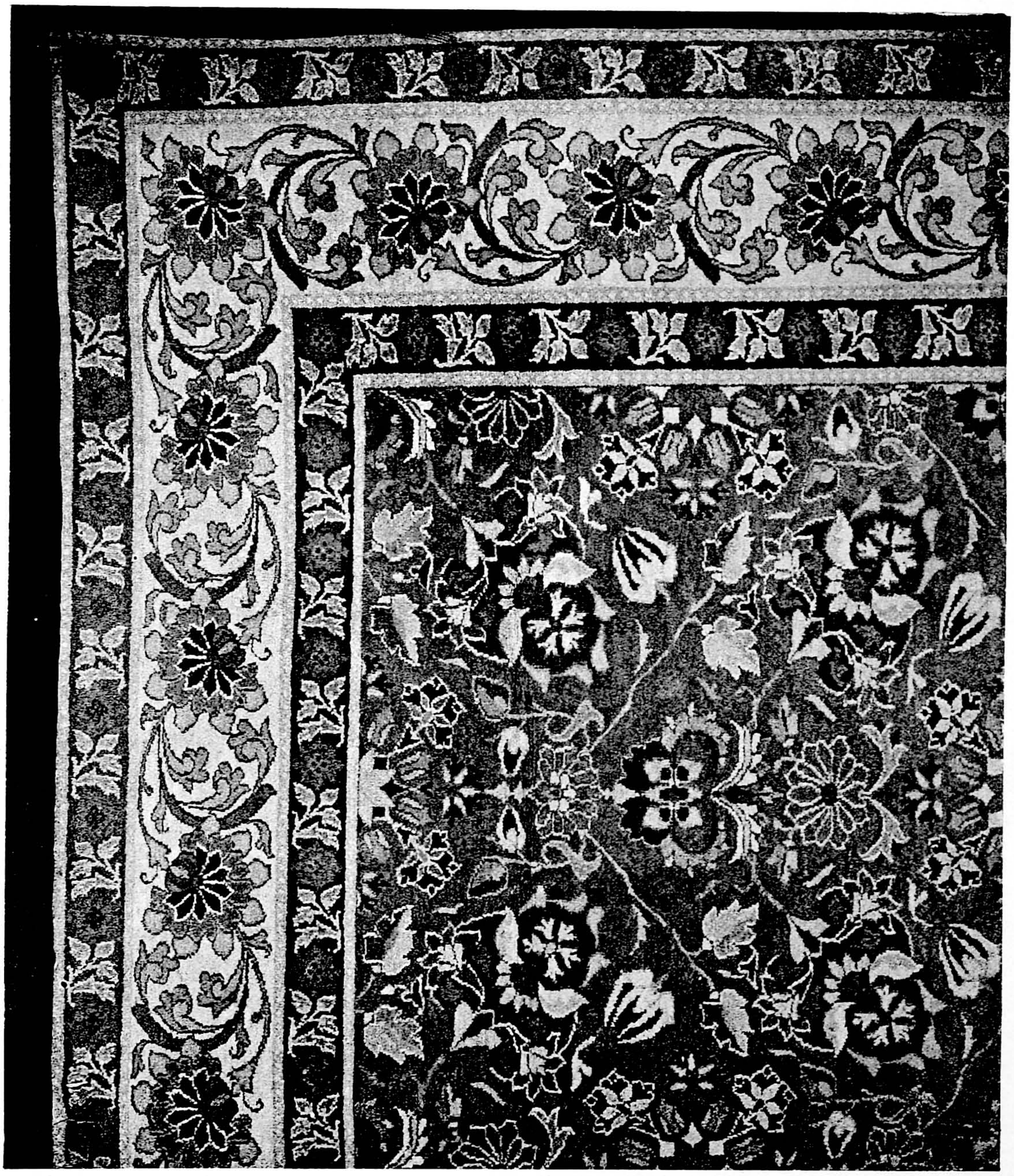

The design is apparently of European origin.

PLATE XXXVII.

Woollen Pile Carpet—Thana.

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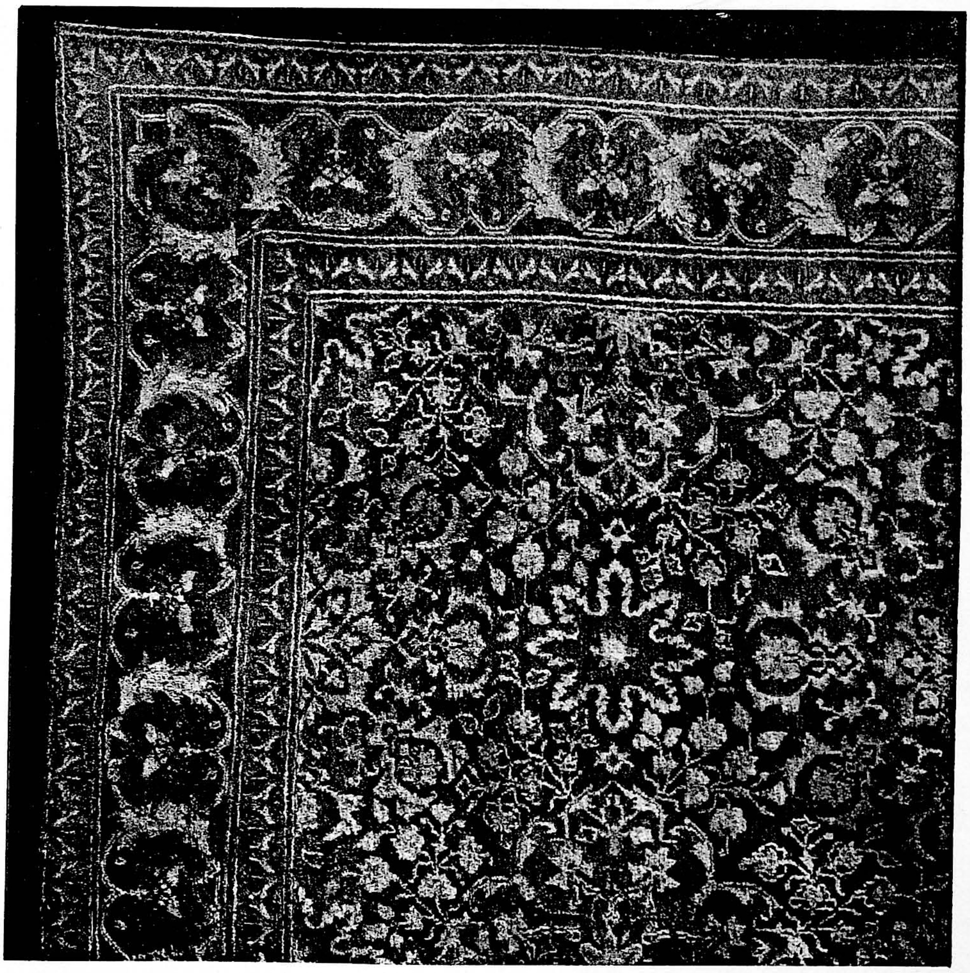

This design also seems to be of European origin.

PLATE XXXVIII.

Woollen Pile Carpet—Thana.

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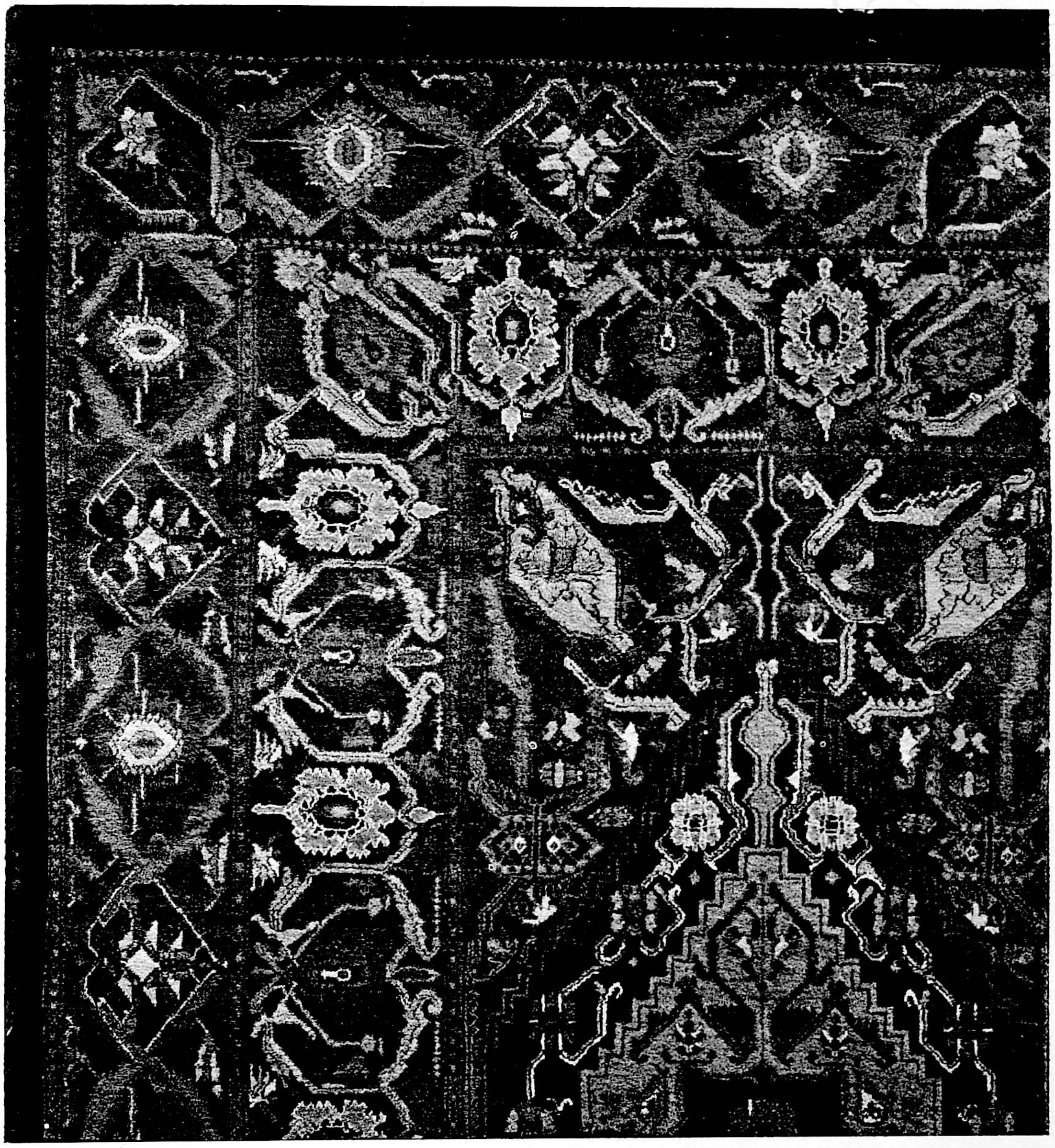

Copied from an old pattern formerly at Yeraoda.

PLATE XXXIX.

Woollen Pile Carpet—Thana, copied from Yeraoda.

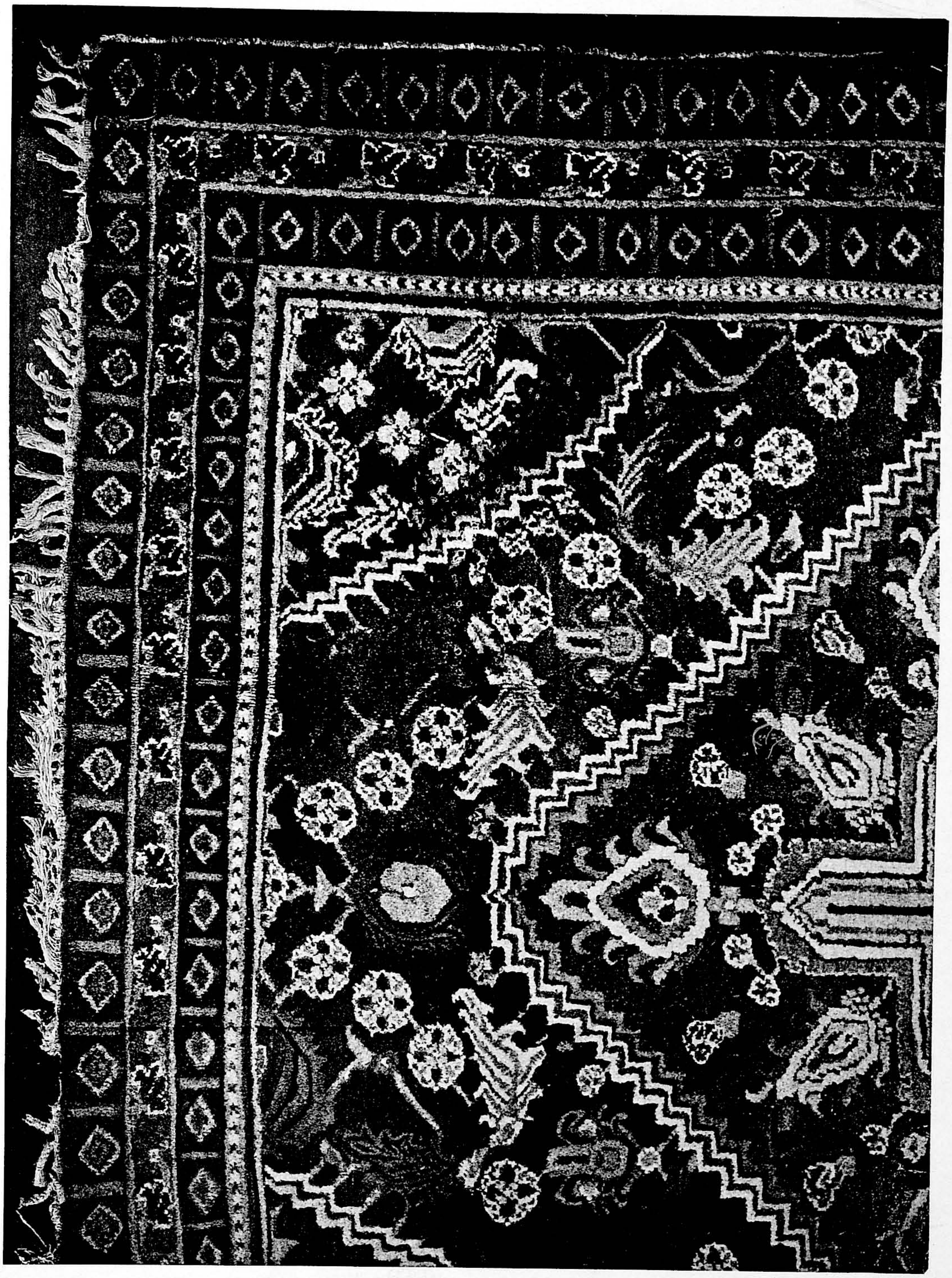

PLATE XL.

Woollen Pile Carpet—Thana.

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PLATE XLI.

Yeraoda.

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Copied from one of the old Bijapur pile carpets. The Frontispiece and Plates XLI and XLII represent three out of the 15 or 16 original Bijapur carpets.

PLATE XLII.

A copy of the Bijapur Pile Carpets—Yeraoda.

This represents one of the handsomest of the entire series.

PLATE XLIII.

Pile Carpet from Khairpur.

PLATE XLIV.

Pile Carpet from Khairpur.

1 DEC 1938

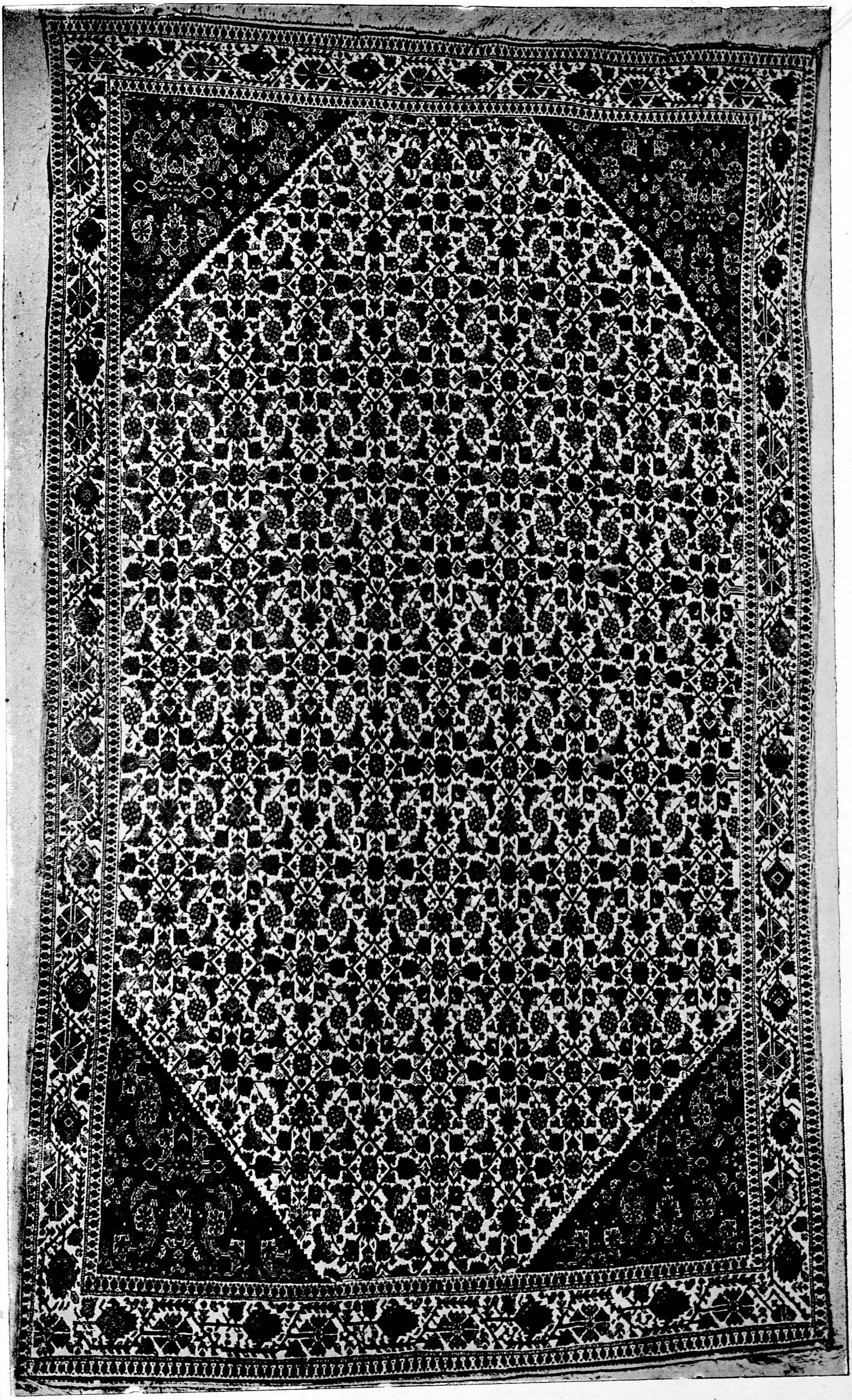

PLATE XLV.

Silk Carpet made at Khairpur.

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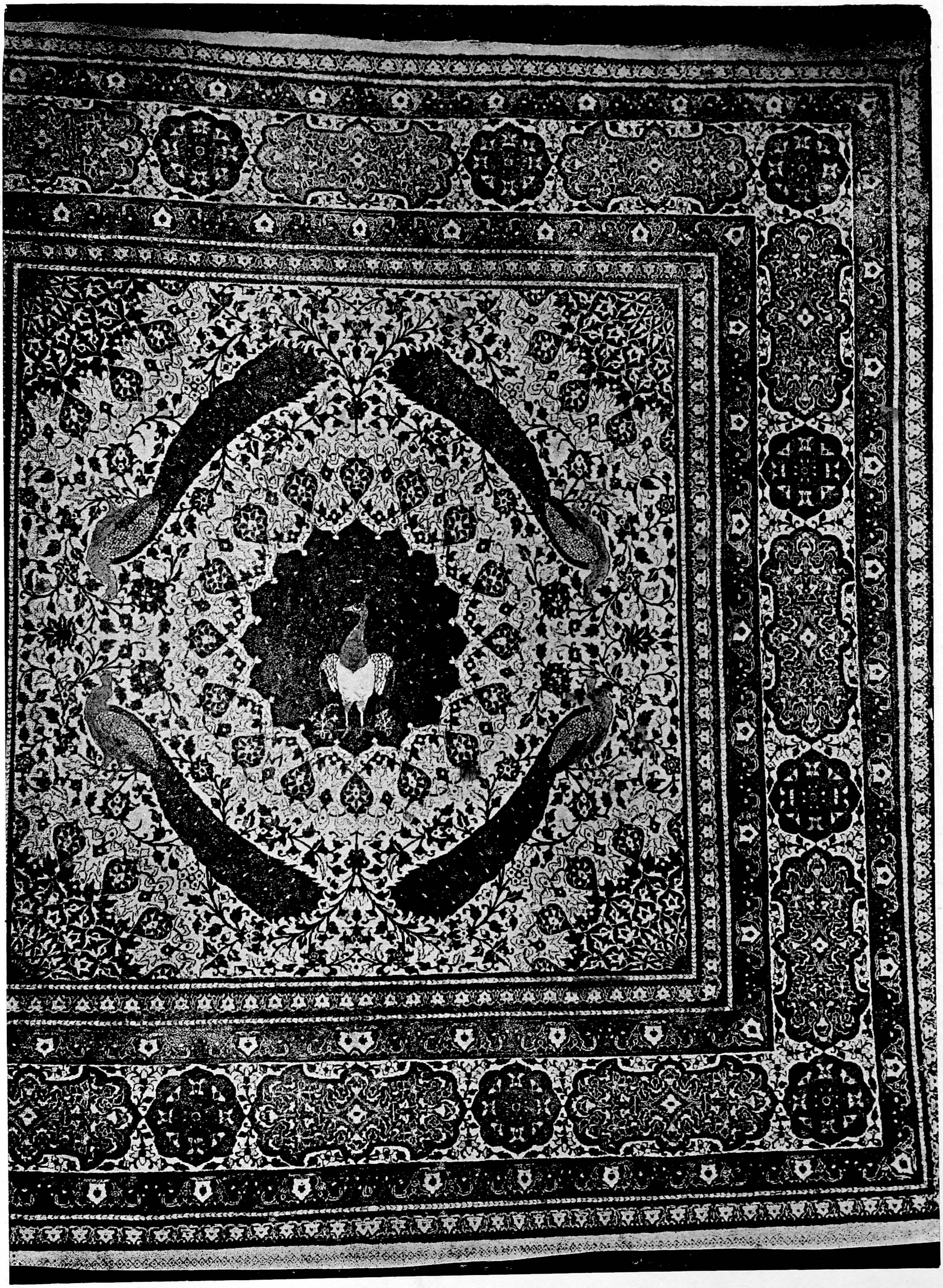

PLATE XLVI.

Woollen Pile Carpet from Khairpur.

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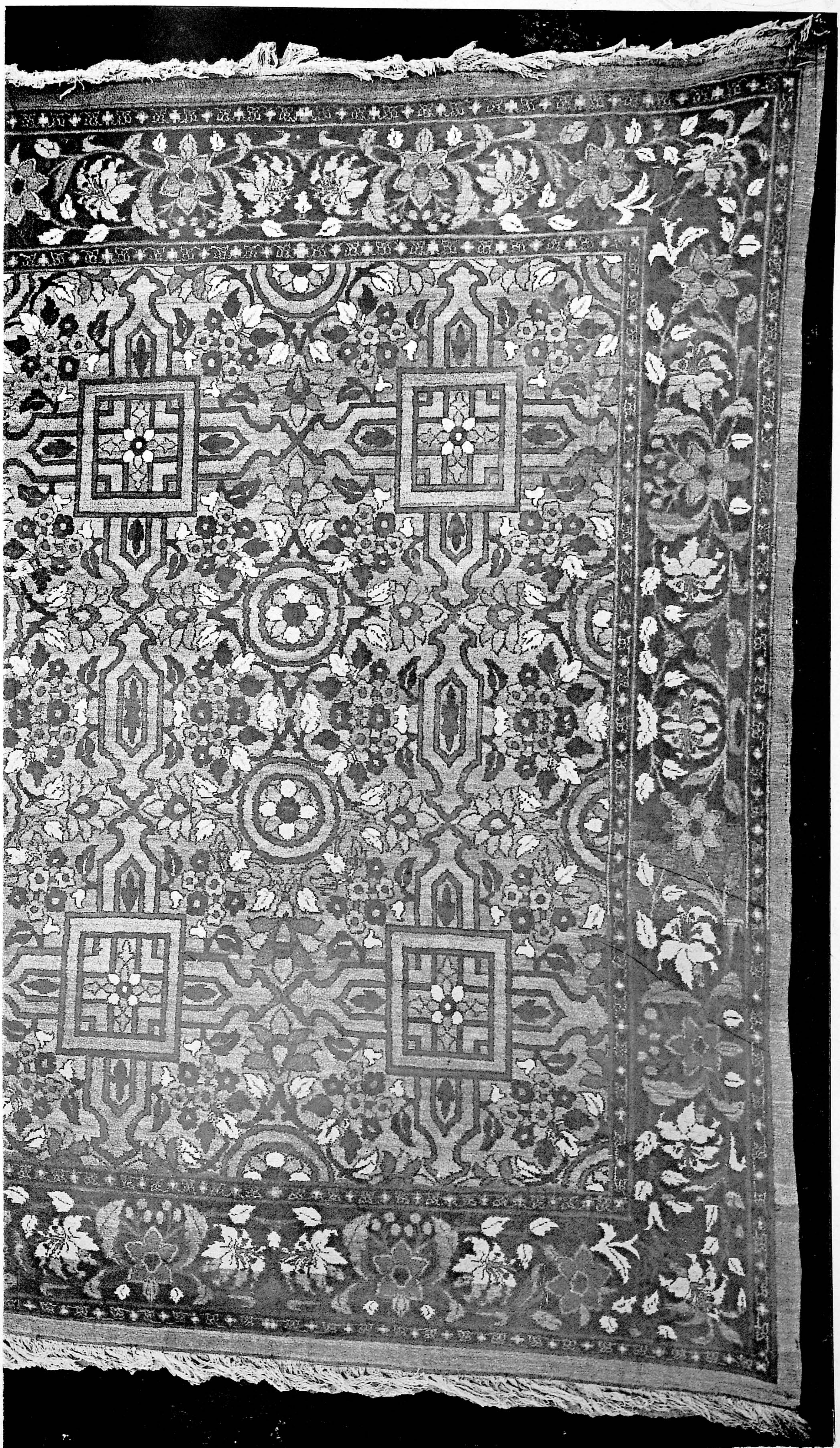

PLATE XLVII.

Woollen Pile Carpet from Khairpur.

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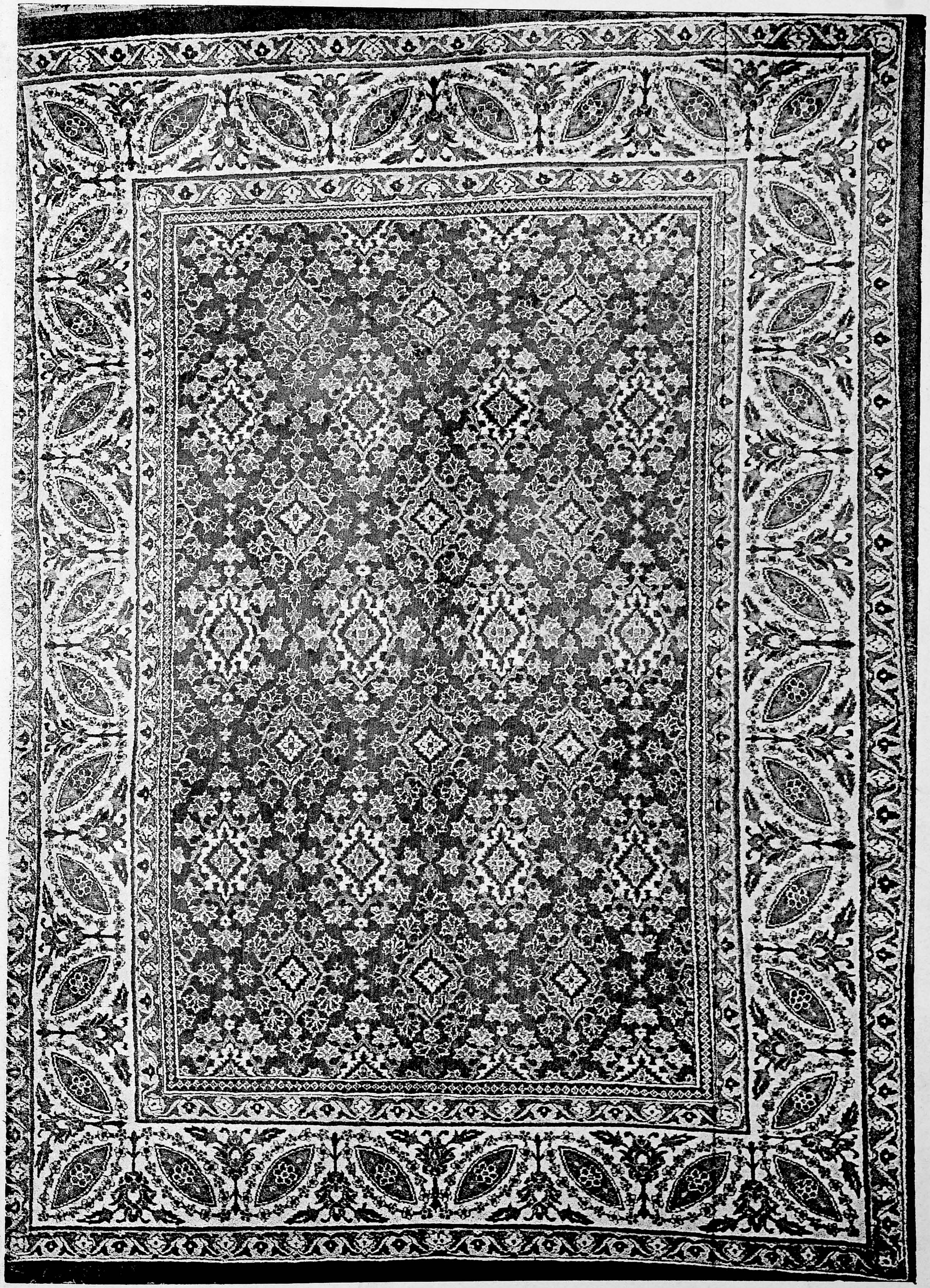

CHAPTER VIII.

The Carpet Purchaser's 'Vade-mecum.'

The introduction of such a subject into an Industrial Monograph may seem unwarranted, but as not a few would-be purchasers refrain from buying from ignorance of the points which indicate a good carpet, a few very simple guides calling for little technical knowledge may be of use. In this chapter too certain matters awaiting mention can be conveniently introduced.

It is assumed that the reader lives in Bombay or Karachi or in the Bombay mofussil and that he desires to select *daris* and carpets from the stock of a carpet-vendor. What considerations will guide him in his selection?

With most people price will be an important factor, if not the most important, while the other pressing matter is the purpose to which any purchases shall be put. It makes a great difference whether the articles are to be sent to Europe or whether they are for use in the hotter or colder parts of India. If for Europe or the colder parts of India, *daris* will not make the chief part of the purchase, through for hot stations such fabrics are to be preferred. For the man who is always changing his station, large *daris* with a few woollen rugs not exceeding about thirty square feet each is the best selection.

If a woollen carpet is intended for use in Europe, in nine cases out of ten, especially if a lady has control of the choice, an attempt will be made to match the carpet with the other articles in the room. This reduces the selection almost to a mere matching of colours, for which only an inherent taste or careful training will provide a safe guide. Considering that a good pile carpet will outlast all the minor articles in the room and possibly many of the heavier pieces of furniture, and that frequently the wall colouring is only in accordance with the passing fancy of the day, it would be more logical to follow the example of Lord Clive, who, in order to set off to the best advantage one of his carpets, designed and fitted a room for its reception. This of course for most of us is impossible; still the tendency to subordinate the carpet to the furniture is becoming too common. It may be laid down as a general rule that the ground colour of the carpet should be darker than the predominating colour of the walls and furniture. This is especially true if the room be furnished in deep rich shades, or at least if there be no predominance of delicate light tints.

As to the design, the main object to be attained by a carpet should never be forgotten, namely, that a pile carpet should provide to the highest degree possible the sensation of softness to the tread, of warmth, and of general luxury; and with all this it should not obtrude upon the general arrangement of the furniture in the room. Any carpet in which the figures either by faulty design or incorrect colouring catch the eye, and above all seem to catch the feet of the

passer-by, is defective. The feet should be able to traverse the carpet in any direction without any sub-conscious desire on the part of their possessor to follow out the figures woven in the design. Absence of predominating figures is therefore one criterion of a correct design. Another test akin to it is the requirement that, from whatever side examined, the carpet should look equally well. This is really only an extension of the first condition.

If the purchaser wishes to select a carpet for a room in light delicate shades and has no natural or acquired taste for colour-combination, and is contemplating a heavy financial outlay, he will assuredly do well to trust neither his own judgment nor any book description, but will rather call in the services of a professional artist, or will apply to a high-class furnishing house for advice. What he will not do is to search for a carpet of Oriental design and with altered colours. Along with altered colours he will probably find altered relative dimensions, and it is almost certain that not only will the original design suffer by a re-arrangement of colours, in addition the attempt to alter the relative dimensions will most likely damage the figuring of the field and ruin the borders at the corners. Most Oriental designs are of Persian origin, intended for long narrow rooms, generally devoid, as Eastern rooms are, of furniture. Such designs were woven into carpets in strips, and along the edges the guests reclined on cushions, leaving the centre of the field open for careful inspection. To represent in such an area a flower-strewn field unbroken by any predominating figure was the Persian's idea of luxury in house adornment. European rooms, studded with articles of furniture, scarcely demand such a rigid freedom from bold striking figuring. Having decided that a certain ground colour will do, and that the general design is suited to the room selected, the purchaser proceeds to consider the quality of the work. The average reader knows that the test of carpet-weaving is the number of stitches to the inch. This may be the case, but how to count the stitches is by no means the easy process one imagines. The matter reduces itself to this: that if the lower surface of a pile carpet be held at arm's length and from that distance the eye is able to easily discern which is *poth* and which is the looping of the woollen pile, the weaving of that carpet is so coarse as to render the article certainly inferior, and an exact counting of stitches is not of great importance. If, on the other hand, the *poth* cannot be discerned at arm's length, while even an examination at the ordinary reading distance fails to reveal its presence, that carpet is certainly not inferior,—but it is not an easy matter to count the stitches.

The matter is further complicated by the fact that the real test should be the number of stitches in a square inch. If, for example, the warp is so arranged that there are ten threads to the front and ten at the back in each inch, with correct weaving the front and the back rows eventually fall into one line of twenty warp threads per linear inch. If on top of all this there are twenty rows of woollen loops applied apart from any *poth* in each inch of carpet measured at right angles to the warp, it is clear that each square inch contains 20 by 20 or 400 stitches per square inch.

In practice it is commoner and simpler to calculate the stitches in a linear inch, which inch is measured parallel to the warp threads. To count the

threads, a very coarse carpet should be taken first. Along two of the edges will be found fringes made by plaiting up into little tassels every five, six, or seven cotton warp threads, as the case may be. Obviously the line of these threads indicates the direction in which the warp runs. Push in a needle at any spot through one of these threads, and at one inch farther along the same thread insert another needle, and the number of woollen loops intervening gives the number of stitches in an inch. It will be absurdly easy to count these in a coarse carpet, annoyingly difficult in a closely-woven carpet. If a coarse fabric be examined on its lower surface, the thin transverse lines of cotton *poth* will be seen as transverse bands crossing the warp at right angles. If two consecutive bands of *poth* be isolated, then the row of woollen loops between them will enable the observer to learn what sort of stitch has been adopted. He will carefully remember that when the carpet was commenced the warp threads were built up in two rows, a front and a back row. He will also remember when reading about knotting that apart from such refinements as Turkish and Persian knotting there were four ways in which loops could be passed. A single loop of wool could be made to embrace one warp thread only with its corresponding fellow to its rear. This is single knotting with single threading. The same process could be adopted, though with the woollen loop bent back on itself, so that a single knot with a double loop results. In the third form two pairs of warp threads are surrounded by a single woollen loop (double knotting with a single thread). In the last and fourth form there is double knotting and double threading. Now each of these ways produces a different appearance on the lower surface of the carpet. If the very coarsest carpet available be selected, the thick warp threads will be seen from the lower surface with coarse wool rolled round them. If one layer of *poth* be separated from the next, it will be seen that double rolls encircle each warp thread, and that after encircling one of the warp threads the rolls pass along to and round the adjacent thread on the right or left. One more point is conspicuous in such a coarse carpet. So thick are all the parts that the warp threads fail to fall into one line, and the original laying out in two layers can still be faintly traced. Push a needle from the lower surface of the carpet through the centre of a warp thread. Now repeat the process through the next thread as seen from the lower surface. If the upper surface be now inspected it will be found that a warp thread intervenes between the tips of the needles. If any carpet replies in that way to such a test, the foundation is coarse. Having studied on an obviously coarse carpet the appearances presented under varying forms of weaving, the purchaser will know roughly what to expect with the more finely-woven fabrics. Whatever he saw in the first, he will see on a smaller scale in the other. He will bear in mind that in no carpet rising above mediocrity will he find double threading anywhere. That is to say, if he picks out with a needle a piece of *poth*, he will find between it and the next piece of *poth* on any one warp thread only one circle of wool. Double knotting, that is, the engagement of four warp threads at each approach to the work, is permissible in even good carpets in the back-ground only, or at least wherever large masses of uniform colour have to be filled in. For a really good carpet only single loops of wool should be passed, and at each passing of a loop only one front and rear warp thread should be concerned.

The practical outcome of all this for the would-be purchaser is as follows. If the *poth* can be easily made out a yard or more away, the carpet is inferior (Class A); if no *poth* whatever can be seen unless the depths of the fabric be closely searched, the carpet is well woven (Class D); if the *poth* can be made out readily at ordinary reading distance, and if the lines of wool between the *poth* rows appear at a general glance to run in pairs, and if further the wool from one warp thread seems on the lower surface to go across to one of the adjacent warp threads to the right or left, the carpet is of moderate weaving though it tends to inferiority (Class B). If on inspection at close quarters the eye can make out between the layers of *poth* that the wool encircles one warp thread by itself in a single loop, the carpet is of moderate weaving though it tends towards superiority (Class C). As to the number of stitches in an inch, the double knot correctly counted reckons as one. With such an understanding Class A will show about 7 or 8 stitches in an inch at most, Class B about 12, Class C varies from 18 to 22, while Class D will show from 33 upwards. These are very rough estimates of the carpets offered for sale by the ordinary shopkeepers selling such articles.

With many the presence of long pile has great weight. A long pile carpet does not wear well, for the drag on the wool is far greater than in the shorter piled articles. Further, it is not possible, except at fabulous prices, to get long pile carpets in fine intricate designs. And as a long pile greatly increases the expenditure of the most costly part of the carpet, namely, the wool, it follows that either a very high price must be paid or inferior wool must be included. A pile of a full inch is long in the extreme and is seen only on rugs from Asia Minor. Three-quarters of an inch of pile is longer than is generally met with, though certain carpets made with pile of that length in one of the large jails met with high approval in England. Persian carpets, if correctly made, have a pile of three-eighths of an inch or less. Of the carpets to be seen in Bombay shops those with the longest pile generally come from Mooltan.

Another test of the fineness of the work is always at hand, namely, the number of warp threads in a linear inch. These threads are best counted at the fringed end. If one of the plaits be undone the number of threads in each plait will be known, and by unravelling one of the threads the observer will be able to discover what count of cotton has entered into the warp. The finer the count the better in all probability will be the general work in the carpet. Suppose there be in ten inches six plaits, suppose further that each plait contains the ends of eight threads, this gives forty-eight threads or twenty-four pairs in ten inches. In practice so few would rarely be met with, for generally there are fourteen pairs of warp threads in each linear inch. Most of the carpets made in jails have this number. To state that on unravelling one of these forty-eight threads the examiner will discover five, six, or seven still finer threads of No. 6, 10, or 20 count, as the case may be, is not telling him much, for only practice will enable him to recognize the count of any particular thread. The more general remark that the finer the thread which enters into the warp the better in all probability the general work in the carpet, will probably suffice for the ordinary purchaser. If he remember that the fringe of a carpet with No. 20 count appears at first glance to

be made of what the average man would regard as ordinary sewing thread in contradistinction to the ordinary cotton seen on cotton reels, he will have a practical test for the recognition of good warping in a carpet. If the tassels at the end are made of decidedly thick string such a warp will be coarse.

For the expert the weft affords further tests of the quality of the general work in a carpet. The object of the weft is to assist in the fixation of the loops of pile, together with the guarding of the fabric against lateral stretching. The fewer strands that will effect these ends the better. On this account the *poth* is generally made of three, four, or five strands of quite thin cotton applied untwisted so as to lie flatly between the rows of warp thread. For the best carpets however two threads only twisted into a very fine cord are used. The space taken by such a cord is exceedingly fine, and it is too much to expect the average buyer to be able to extract from the depths of the pile a portion of weft and from it to arrive at any conclusion as to the general make of the carpet.

Two more points remain which will certainly attract the attention of the purchaser. The clearness of the design will at once be noted. The way to obtain a blurred figuring is to weave into the warp a long pile with pieces of wool unevenly spun. On the other hand, the way to procure a clear intricate design, with possibly the figuring on a very small scale, is to have a very short pile only and *even* spinning. If a piece of wool be spun on a hand-*rahat* so as to form a cylinder of uniform calibre though of considerable dimensions, such a piece of wool on being worked into a carpet will give complete satisfaction, for not only will all the cut ends present the same amount of surface and therefore collectively contribute to that evenness of surface which is absolutely essential in all good pile, but in addition, thanks to the even spinning and the moderate amount of twisting, each piece of pile end will on being clipped unravel to a slight extent only, and will do so to the same extent as its neighbours. Consequently there will be no pieces of pile kinked or bent away from the general direction of the whole mass The surface will appear like a field of upstanding corn over which no rain or storm has passed to beat the stalks about irregularly.

If therefore the design is not clear, and if on examining the pile in detail one piece of wool is markedly thicker than another, and still more if any one piece of wool is thick at one part of its length and constricted at another, the spinning in that carpet is bad. Moreover, as uneven spinning indicates tight spinning in one place and loose spinning in another, it follows that the dyeing is apt to be very uneven owing to the different rates at which the dye will penetrate the spun wool. This uneven spinning is one of the causes of that unequal dyeing in Eastern carpets which some deplore while others admire. Undoubtedly for carpets intended for European use even dyeing is essential. For carpets which are intended to show Oriental practice, and to be correct copies of genuine Eastern work, to insist on exactly uniform dyeing is as reasonable as to insist on perfect symmetry in the design, asymmetry being a marked feature in all genuine Eastern carpets. The attempt to copy any form of Indian handicraft, be it carpet or pottery or what one will, correcting at the same time those obvious irregularities which appear in nearly every specimen, and reducing the whole to a machine-like regularity, is to take away the entire charm of these articles. No doubt for

purposes of pure commerce, especially for a commerce which mainly concerns the United States, reduction of the carpet craft to machine-like processes is unavoidable; nevertheless there is no gainsaying the fact that no matter how excellent some of the recent designs may have been, and how good the grouping of colours, still the carpets produced represent not Eastern work in the least but Western work made up by Eastern hands.

The last point to be considered by the purchaser, though in all probability he will have attended to it much earlier, is the dyeing. Every buyer asks himself 'Are any of these colours aniline?' The answer to this question is much more uncertain than most people realise, and in the opinion of the writer for many colours the only test is that of experience. In other words, if the carpet be kept for five years, any colours in aniline will have so changed as to obviously alter the general colour effect. Many tests have been suggested for the detection of aniline, though no single test can be relied on, especially as the effects are merely relative, the change alleged to occur with aniline also occurring with vegetable dyes though to a less degree. The simple plan of slightly moistening the fabric and then rubbing it with a handkerchief is the most usual test, especially for reds. The same test, substituting eau-de-cologne, is said to be a better indicator; the writer has not practised it on made-up carpets. Another test is supplied by a careful scrutiny of the pile-ends. The tint at the extreme end and on the surface differs from that in the deeper parts of the piece of wool which indeed by comparison may look white or undyed. This unevenness is also met with in vegetable dyeing, but only in processes which are brief and simple It merely indicates an unequal distribution of the dye throughout the fibre, and consequently in such processes as are involved in madder or *manjit* dyeing, so thorough must the saturation with dye be, after so many processes, that uneven distribution is most improbable. Aniline dyeing in very many cases reduces itself to merely adding a powder to hot water, putting in the article to be dyed, and then taking it out again. There is little wonder then that the dye may be uneven. The next charge alleged against aniline is that it fades unequally. No one denies that vegetable colours fade, but a faded carpet dyed with vegetable dye only is more beautiful than it was on the day it left the loom; a faded aniline dyed carpet is perfectly hideous. And not only is the fading unequal, it is also apt to be very abrupt, for example, a dark green instead of shading off to a light green becomes spotted with yellow. No doubt in course of time expert chemistry will be able to eradicate or minimise these defects.

The would-be purchaser has by this time been advised on the following points: (*a*) whether to select pile carpets or *daris*; (*b*) if for Europe, the general design and ground colour which will best suit the purposes for which the carpet will be used; (*c*) the closeness of the work as judged by the number of stitches in a linear inch measured along a warp thread; (*d*) the value of *poth* as a rough indicator of coarse or fine work; (*e*) the pile; (*f*) the quality of the warp as indicated in the fringed ends; (*g*) the clearness of the design with the quality of the spinning; (*h*) the dyeing.

Having considered all the above points he will at least have something to go on in deciding what would be a fair price to give for his selections. At the end of

the paragraph dealing with stitches per linear inch he will note that four classes have been given as guides. For Class A he will not pay more than one rupee a square foot at the most, and in fact fourteen annas would be a fair price. The design will be large and bold, the wool inferior, indeed he will hardly know whether to consider it hair or wool; the stitches will be thick; the *poth* will be seen at the back of the carpet from possibly half way across the room.

For Class B he must be prepared to pay about Re. 1-4 a square foot, and the *poth* of such a carpet will be discernible without any separation of the parts with the fingers at ordinary reading distance, while the stitches can be counted off at the same distance without trouble. Carpets of this quality will form the great bulk of the articles which he will find in the ordinary way in shops.

For Class C he must pay a price which varies from Rs. 2 to Rs. 2-8 a square foot, according to the stitches in a linear inch. He would do well to make sure that there were at least fourteen pairs of warp threads in a linear inch, as a fewer number would indicate that the carpet hardly attained to Class C. And should he feel confident that he could certainly discriminate between double and single knotting and between double and single threading, allowing that double work in the filling in of the back-ground was no great drawback, he would be able with all the more confidence to know whether he could advance beyond Rs. 2-8 a square foot and yet get value for his money. Most of the good jail carpets would fall in this class, a few jáil carpets falling also into Classes B and D.

Carpets of Class D should almost invariably have short pile; the *poth* should not be seen from the back unless the fingers well separated the woollen loops. Each warp thread should seem to have one woollen loop only passing around it and going to the upper surface as pile ends; double knotting and threading should be quite absent; the whole fabric should be thin and pliable; the stitches as a mass should be so closely beaten as to require keen eye-sight or careful scrutiny for their exact inspection. Without being dull or washy in appearance the field must be devoid of glaring figuring or colours. For such a carpet any sum may be given according to the degree with which it complies with the conditions enumerated above. Such carpets are generally only made to order, and in this Presidency can only be had at Yeraoda and the Art School at Bombay as well possibly at the Ahmednagar School of Art. The great bulk of such carpets made in this Presidency come from Yeraoda mostly as undyed natural wool carpets. The price asked for such could reasonably be anything about Rs. 3 a square foot, while Rs. 3-8 would not be unreasonable.

All the above remarks refer to pile carpets only. *Dari* purchasing in this Presidency is a comparatively easy process. Excluding articles which, properly speaking, are *purdahs* and are of thin material, the purchaser should be prepared to pay about two and a half annas a square foot for any *dari* in which the design is in transverse bars only without any border; but if any border be added, no matter how simple, the price would be about three annas. The many *daris* in purely geometrical designs limited to straight lines only generally cost four annas a square foot; while if there are many diagonals, about half an anna extra would be asked. What are known as 'simple floral designs,' that is to say, designs in which a few

simple curves are introduced here and there, would cost five annas. Beyond these grades all *daris* are practically jail-made only and vary in price from six annas a square foot to twelve annas, the price asked for the superb *dari* which is shown in Plate XXVII. After seeing the illustrations of the better *daris* and remembering how well suited these articles are for warm climates and district life, the reader will acknowledge that they possess many advantages over pile carpets for use in India.

Not much practical use would result from any statement of how hair, jute, and other adulterants can be detected in carpets to which they have been fraudulently added. Many carpets are legitimately made of hair, many more have it fraudulently added. Although the most inattentive could discriminate between a horse-hair and a teased-out mass of *pashm*, between such extremes there are gradations so fine that in any one carpet only the practical workers and the professional buyers of carpets can with certainty tell to what extent adulteration has occurred. Microscopic and other tests exist, but obviously the average carpet-buyer would not find it convenient to subject his selections to microscopic scrutiny. The few simple guides indicated in the preceding parts of this chapter will, apart from tests for adulteration, possibly suffice for ordinary purposes.

One point more alone remains for discussion under this heading. Is the average uninformed purchaser able to judge from the general design or texture from what locality any particular carpet comes? In Bombay to a very slight extent he can. For example, among carpets of Class A most will come from Mirzapur, the longer piled specimens coming from Mooltan. Of Bombay Art School carpets he will assuredly see none, for all are to special order, while most of the Nagar carpets are exported. In fact, hardly a single pile carpet offered for sale in the shops of Bombay City will have come from within the Presidency. In Karachi many Bhubak carpets of coarse workmanship and characterised by the 'trefoil' along the border will be found; in both Bombay and Karachi nine carpets out of ten will be of small dimensions, about the size of a cot, coloured mostly in reds and blues, with an arched design after the prayer carpet type, with possibly much of the field occupied by the Persian 'pear.' Still more characteristic will be the existence at each end of a very wide bordering or *patti*, not of uniform tint but woven in thin lines of red, blue, white, or yellow, while along the other edges at intervals of about three inches will be tied on tassels of wool and at times shells. The 'Feraghan crescent' never appears in these designs. Such in the main describes the modern Shiraz rug of commerce, made in thousands in factories in Southern Persia. A few years ago their colours were atrocious; with the prohibition of aniline an improvement in colouring has taken place. The other large bold designs met with come either from Southern India or from Kashmir, but such carpets will probably only be found in large shops.

Formerly all pile carpets were made with a woollen warp. Of carpets made in India few are now so manufactured; those coming from Persia and from districts beyond the North-West Frontier still exhibit a woollen warp. The Shiraz carpets referred to are all made of wool entirely. Silk carpets will only be discovered in a few shops and are such rarities as to justify no further reference.

CHAPTER IX.

Retrospect and Prospect.

Looking back over the last fifty years, what is the general history of the carpet making craft in this Presidency? It has on the whole been a period of decline both with regard to *daris* and *galichas*. About fifty years ago Ahmednagar had a considerable industry in pile carpet making, the output going to most parts of the Presidency. That industry died out entirely. The existing Ahmednagar industry is of recent growth and deals with a fabric differing in many respects from the old Nagar carpet and has its market almost entirely in America. Attempts to introduce pile carpet weaving into Ahmedabad and other places have been uniformly unsuccessful. *Dari*-making has fared no better; and save for Navalgund no industry utilizing free labour exists for the making of any form of *dari* worthy of the name. Village employment as regards carpet making is now restricted to Sind, and even there the work is being carried on in ever-declining magnitude. The few cases in which the industry survives have peculiar facilities for getting wool or superior dyeing agents.

As to the numbers formerly and now employed, from earlier records it is clear that the first group only amounted to a small and insignificant proportion of the whole population, and that most of those then employed were engaged in the coarser cheaper forms of *dari*. At the present time the numbers finding employment in carpet making form a fraction of the whole population so small as to defy accurate computation, and of even these few many only employ a part of their time in the work, or resort to it during lulls in other occupations. Women in Sind, boys elsewhere, and an elderly or lame man here and there, form the majority of the workers. For these humble folk the remuneration earned is little enough, generally averaging four annas a day, with liability to deductions if raw materials give out or prove inferior.

The history of carpet making in India as a whole during the last fifty years differs somewhat from the experience of Bombay. The Great Exhibition of 1851 greatly stimulated the trade in Indian carpets, though the industry gradually dwindled in bulk with marked deterioration in quality till about ten years ago. The jail system, the desire for carpets at any early date after the beginning of the work, alterations in Oriental design, copying of Occidental patterns, low prices, all of these factors, collectively and separately, have been charged with causing this depreciation. Most people now concede that the jail system has had very little to do with it; that the main cause, which also accounts for practically every alleged reason for deterioration, has been the demand for cheap carpets. Early delivery from the loom, modification of design, alteration of colours, and in particular the introduction of aniline dye, all these procedures mean a saving of money to some one. If customers always would and always did give high prices for

carpets, the charge that jails under-sold the public market would never have been raised; while Dr. Bocarro's computation that a Bhubak carpet costs Rs. 18 whereas a Shikarpur Jail carpet of equal dimensions costs Rs. 42 is typical of the relative charges asked for carpets made by free and convict labour. Without doubt the main cause of deterioration has been the clamour for a cheap article. Jail labour has not yielded to it; free labour has been compelled to do so.

During the last ten years there has arisen, notably at Amritsar, and also at other centres, such as Lahore, Agra, and Mirzapur, an enormous demand for carpets intended almost exclusively for the American market. As jail-made goods are kept out of the United States, convict labour can in no way interfere with this industry, which, it should be noted, flourishes exceedingly. As to the quality of the work done, judging by the samples of carpets which find their way into this Presidency, the opinion is given that, on the whole, taking into consideration the low prices asked, the output is of better quality than could be turned out in any other part of India. This remark refers exclusively to the Amritsar output. It is well known that the most prominent firm there has for many years spared no pains to procure Oriental designs, while the combining of colours, now alleged to be purely non-aniline, is particularly studied. It is not unlikely that the comparatively few carpets which leave this firm for this Presidency do not represent by any means its best class of work. That probably goes to America. Orders at five rupees a square foot are not unknown. Considering this enormous American trade as a whole, probably one half of it is in rugs about 7 feet by 4½ feet at a price of Rs. 40. For such an article the demand in the States would be unlimited. Rugs of such a quality would be found in the houses of the masses. There is a firm at Agra which makes a specialty in colour combination, and anyone visiting the Sind Club at Karachi will be able to see for himself good serviceable carpets for every-day use, well designed and coloured, at a reasonable price. The writer is given to understand that, in spite of the proximity of one of the most famous of the carpet making jails in India, this firm experiences no serious competition from its neighbour.

There can be no doubt that, as intimated by the Principal of the Art School, Bombay, no Indian carpet firm would flourish except for its export trade. This export trade being essential to its well being, its traditions and requirements have to be respected. The buyer in America, in nine cases out of ten, cares not one rap for an Oriental design, and in ninety-nine cases out of a hundred he positively objects to many of the colours found in Oriental carpets. Nor do the irregularities in design and the uneven dyeing appeal to him in the very least. Whence it is very clear that for an undertaking to flourish it must modify its output to Occidental wishes.

Outside India but within Asia the craft of carpet marking has grown fully as much as at Amritsar. Persia, in the north and west and south, now abounds in carpet factories, financed for the most part by Americans and managed by Germans, Russians, or Armenians. The character of the output agrees in most respects with the Amritsar output, retaining the main local features of Persian workmanship. But the modification of Eastern to Western desires is everywhere seen. In Asia Minor the same goes on, Brussels and Kidderminsters being copied with modifications of local features in a very long pile. A certain proportion of

these Persian carpets enter this Presidency and form part of the competition to which the local maker is subjected. Again, from the east of Persia and Seistan, thanks to improved communications, carpets enter in increasing numbers, though it seems that the opposition these imported goods meet is too much for them. Probably the goods are far too highly priced for a large market.

As to competition from Europe, both the United Kingdom and Germany, the latter in steadily increasing numbers, send carpets. It is by no means clear where these find a final resting place. Judging by the samples which the writer has from time to time discovered in bazars, it is clear that the German moiety at least is of most inferior quality. With reference to *daris*, especially as regards those of small size, Agra and Cawnpore are now able with steam-driven machinery to completely oust out every locally-produced *dari* of simple striped design. The people who have mostly felt the pinch of this competition have been the small home weavers of the Khandesh and Nasik Districts. The success which attends the Agra-made *dari* is due not a little to the fact that a well organized agency permeates the whole country, making use of every little advantage which prompt delivery, transmission in bulk, etc. etc., afford.

One of the salient features in the demand for cheap carpets is the spread of aniline. Persia considers its carpet making craft one of its chief sources of revenue, and the maintenance of a high standard of work is essential for its continued existence. Kashmir too owes not a little to its crafts, most of which involve the use of good dyes. There is little wonder then that in those countries the introduction of aniline is now forbidden. What would be the effect of prohibiting the introduction of or the further sale of aniline in India? Certainly the indigo-growing districts would benefit, though synthetic indigo is not a complete success seriously threatening the extinction of the plant. Enormous tracts of land in the Berars, Bundelkhand, Nagpur, and in this Presidency the Northern and Central Divisions generally, would again be planted out with *al* and *morinda*, while *kasumba* growing would employ large numbers of people. It is not improbable that the introduction of a dye which anyone can use in place of a dye which was costly, difficult of manipulation, and understood by only a man here and there, has been at least one factor in the extension of numerous crafts which previously, owing to the cost of dyeing, were followed by only a few people. Without doubt, regarded artistically, aniline could be stopped with advantage, but considered industrially a prolonged enquiry would be necessary before one could confidently assert that no serious loss would follow. Unfortunately so deplorable has been the effect of aniline on Indian arts that a full enquiry into the probable effect of its future exclusion would be well worth the large amount of time and trouble such an enquiry would involve.

No one can look through any of the elaborate catalogues published by German aniline makers without being convinced that aniline has, to use a common phrase, 'come to stay.' Only legislation will keep it out. Judged impartially, aniline has advantages as well as disadvantages; and of the former, the opening up of the dyer's craft to a vastly increased number of workers is not the least. But therein too lies probably the most serious objection to it. The older dyer learned his

craft as does an artist, and the knowledge possessed by his great-grandfather was not lost on him. And he in his turn handed down the benefits of hereditary training to his successors. Nowadays the veriest tyro, lacking all taste in colours and immoderate in the extreme in his contrasts, will gaily introduce into his work the most truly awful combinations. If conceivably every native dyer received full training in the combining of colours before aniline could be let loose over the land, seven-eighths of the damage it could do and is now doing would be avoided. The main danger of its introduction consists in putting into the hands of the multitude an agent which they do not know how to use properly. Every aniline colour is not necessarily vile; many indeed are as good as and as fast as the corresponding vegetable dyes. And without doubt the number of such high class aniline dyes will increase. Judging, however, by the Commissioner of Customs' returns, be the cause what it may, aniline as a whole is getting cheaper—a sign of ill omen, for a fall in price certainly means an inferior article, the very thing which in aniline is least desirable.

Such then in the main has been the experience of the carpet craft in this Presidency. Are there any ways of giving the local manufacturer a helping hand in meeting the competition which faces him? This competition resolves itself into competition with certain towns in Northern India which enjoy great advantages as regards raw material. Amritsar, Agra, and Lahore do not have to send far for their wool, while the cotton thread from which the warps are made are practically as cheap, if not cheaper in Agra and Cawnpore than in Ahmednagar. If in the centre of this Presidency there had been a wool-producing area, then, though not till then, would local enterprise have had a chance, and a favourable chance, against Amritsar. Just as 'possession is nine points of the law,' so is the firm establishment of flourishing firms in the Panjab a fact to be well considered by any prospective manufacturer in this Presidency. Let both start afresh with equal facilities for raw materials, and the Bombay man might have a chance; now he has none.

However, if a pile carpet factory has no chance here, there seems no equally clear reasons why a *dari* factory should not flourish. To do so properly, the maintenance of a high standard of work, with good designs, in effective and harmonious colours, would be absolutely essential, and until a reputation for good work had brought its inevitable stream of orders, a period of losses would certainly have to be faced. The enterprise would have its risks as well as its prospects, but the prospects of a pile carpet factory are small indeed. To lower the standard in a pile carpet factory means certain ruin: to maintain a high standard has more prospect of eventually getting back the capital, though heavy expenditure and initial losses would have to be faced. With a reputation earned, future success would be likely as long as the output maintained its quality.

Expert Cultivation of Dye Plants.—Two points remain for consideration under the heading of measures to foster the industry. No prohibition of aniline, even were it decided upon, would be of much use unless provision were made to resuscitate the cultivation of certain dye plants which are now very inferior or almost extinct. There are hundreds of acres of land intended by nature

for the production of dye-yielding crops, untilled and uncared for in face of the opposition of Huddersfield and Berlin. It would be well worth the time and trouble to investigate the plants which could with advantage be resuscitated, and to determine in what districts this work should be done. Even apart from any abolition of or restriction upon aniline, the resuscitation of these plants is for other reasons desirable. In those jails in which aniline is abolished it is none too easy to get reliable vegetable dyes, and many a superintendent would be glad to hear of the establishment of selected areas for the special growth of dye plants. Such work properly falls to the Forest or Agricultural expert.

There remains the question of schools for training in designing—the Design Studio of Mr. Burns. No one can deny the truth of his remark that very often a jail-made carpet is ruined by the attempt to alter the relative dimensions of a pattern. At the same time want of care accounts for much of the bad work. Still in many cases let the foreman be never so careful there must often be set before him problems which in fairness should only be placed before the properly trained man who would invariably tackle the problem by resetting the entire design on a fresh sheet of 'squared paper.' It will be found in practice that when a convict foreman has to change colours as well as relative proportions he will do the colour work exceedingly well, and in the opinion of the writer fully as well as most trained hands from art schools, while his errors in modifying designs are more often failures than successes. That the training received at art schools is extremely useful there can be no manner of doubt whatever, but its introduction to convict workers seems both extremely ludicrous and also difficult of accomplishment. As convicts assuredly cannot go to art schools, teachers trained at art schools might with advantage be taken on the establishment of any prison where the carpet work by its magnitude and high standard seemed to warrant such an introduction. By no means every large jail would need such a teacher, for, in this Presidency at least, it seems probable that at Yeraoda alone will high class carpet making continue without interruption, and even there with the introduction of the printing press it is none too easy to keep up the supply of trained convicts. With only a few workers available, the patterns with which they are conversant must of necessity be comparatively few in numbers, and probably fewer things would do the Yeraoda factory more harm than any attempt to increase the number of patterns in common use. Specialism is the order of the day in all branches of occupation, and so long as Yeraoda restricts its carpet making efforts to about a dozen Bijapur patterns, two or three superb *dari* designs, and one or two Persian designs at the most, so long will it keep up its high reputation. Let it introduce other designs, and at once the urgent need of the trained designer will be clear; and even now when the convicts know the designs so well, the trained designer's services would be of much value when a carpet of say 5 feet by 7 feet has to be altered to one of 4 feet by 5 feet. If one carefully considers what this means one will marvel how the unlettered worker, who cannot spell his own name, has managed so long to assist in turning out really excellent work. A recent circular letter by the Government of India deals with the question of Jail *versus* Free labour, and no craft is more interested in this question than the craft of carpet making. The general charge against the making of carpets in jails has been that convict labour under-

sold free labour in the bazar. Whatever may have happened twenty years ago such is not the case now. The very high price charged for prison carpets in most jails drives away five orders out of six for pile carpets. At Yeraoda, orders come in from all over the world practically, and there is no question of the price being too high, though remarks that it is too low certainly never have been heard, at any rate by the purchaser. Judging by reports, twenty years ago pile carpets could be had in jails at one rupee a square foot, but the quality was not good. Possibly that was a case of under-selling, for the bazar, though able to turn out a carpet at less price, has to make the quality still poorer. Of late years jail carpets have improved greatly in workmanship, while the price is never under two rupees a square foot, and generally eight annas more. Has the bazar risen with this rise in jail prices? Not in the very least! What drove bazar prices low were bazar buyers, and jails had to come down to within moderate distance of their price. Now jails raise the price, the bazar keeps as low as ever.

The belief is now prevalent that jails of late have tended to conserve good taste and superior work in carpets, and many remarks to that effect will be found in Watts' 'Art at Delhi.' It is felt too that jails should continue to make carpets in spite of a decided current of opinion that convict labour as a whole should on no account be devoted to profit-earning lest free labour suffer. It is essential that a most careful eye be kept on the quality of work allowed to pass out of jails. Indeed, it would not be altogether a harmful thing if in certain jails where, unlike Yeraoda, which has enjoyed a large demand by the public for factory products, orders for carpets are few, the convicts were engaged in the *correct reproduction of genuine designs.* There is in Yeraoda a sample reproduced with much effect for Delhi. This same sample has replicas in Thana, Karachi, Shikarpur, Hyderabad (Sind), and possibly elsewhere, the one copied from the other, with the result that few people would recognize them as in any way related. Much benefit would arise if one of the jails engaged itself in making accurate copies of all the good jail designs so that each large prison could show its visitors a faithful representation of what the original was like. If jails restricted their carpet work to procedure on the above lines, nothing more would be heard of complaints from either the industrial or the artistic side of carpet-making.

With regard to *daris*, the maintenance of a high standard is equally of great importance. There is no doubt that there are better prospects for the *dari*-making industry in this Presidency than of any other form of carpet.

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